YPLSF
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United States
Environmental Protection
Agency

Region 10
1200 Sixth Avenue
Seattle WA 98101

Alaska
Idaho
Oregon
Washington

EPA

28 August 1992

Reply to
Attn of: ES-095

MEMORANDUM

Subject: Transmittal of Data Validation Reports for Yakima Agricultural Research Laboratory

From: Bruce A. Woods, Ph.D.
Chemist, QA Management Branch

Thru: Raleigh Farlow
Chief, TSS, QA Management Branch

To: Lynda Priddy
Superfund

Attached are the data validation reviews performed by the ESAT Team for the semi-volatile (BNA), volatile (VOA) and metals fractions for the Yakima Agricultural Research Laboratory in Yakima, WA. There are some small areas where we did not get every piece of information to perform a complete review, but we feel that these small portions of missing information do not adversely impact the usability of the data submitted to the Agency. Typically the missing information is dealing with documentation that would have an effect on a fraction of the samples in the complete data set. Because we requested this information many months after the samples were analyzed, we expected that some of the information would be missing.

This completes our review of the information that we have received to date from the Department of Agriculture or its' contractors for this site.

If you have any questions please feel free to contact me at 206 553-1193.

Environmental Service Assistance Team -- Zone II

ICF Technology, Inc.

ManTech Environmental

ESAT Region X
ICF Technology, Inc.
1200 6th Avenue
Seattle, WA 98101
(206) 553-6690

MEMORANDUM

DATE: August 18, 1992

TO: Donald Matheny, USEPA Task Monitor
Jerry Muth, USEPA DPO

FROM: Gerald H. Dodo, ESAT Data Reviewer

THROUGH: Barry Pepich, ETM

SUBJECT: Data Validation Report of Semi-Volatile Organic Analyses of Samples from the Yakima Agricultural Research Laboratory

TID NO. 10-9203-045

DOCUMENT NO: ESAT-10-B-6156

The quality assurance (QA) review of 4 water and 33 soil samples collected from the above referenced site has been completed. These samples were analyzed for semi-volatile organic target analytes by SW-846 Method 8270 "Gas Chromatographic/Mass Spectrometry for Semi-Volatile Organics", 3rd edition, 9/86. The laboratory that performed the analyses was Biospherics, Inc., Beltsville, Maryland. The following samples were analyzed:

Waters

9010220	9010220	9010646	9010647	

Soils

9010236	9010237	9010238	9010239	9010240	9010241
9010242	9010243	9010245	9010246	9010247	9010248
9010648	9010649	9010650	9010651	9010652	9010653
9010654	9019540	9019541	9019542	9019543	9019544
9019545	9019546	9019547	9019548	9019549	BGS-1
BGS-2	BGS-3	BGS-4			

The numbers above are believed to be the assigned laboratory numbers except for BGS-1 thru 4 which are actual sample numbers from the Chain-of Custody forms (COCs).

No sample preparation information was included with the data. The laboratory results are in absolute amounts (ng) injected only,

therefore, actual sample concentrations cannot be determined. The sample results are summarized in this memo as absolute amounts which can be used to calculate the sample concentrations should information on sample sizes extracted, final extract volumes, and injection volumes become available.

DATA QUALIFICATIONS

The following comments refer to the laboratory performance in meeting the Quality Control Specifications outlined in Method 8270 and the "Functional Guidelines for Evaluating Organics Analyses, revision 2/88".

The conclusions presented herein are based on the information provided for the review. Information not made available for this review are pointed out in each section affected. All sample analysis results were submitted only in the form of raw data.

1. Timeliness

For all samples except BGS-1 thru 4, documentation that cross references the laboratory numbers to the actual sample numbers on the COCs were not provided. As a result, sampling and laboratory receipt dates were unknown for this review. No sample preparation information were provided for any samples which further prevented evaluation of the data regarding holding times.

Listed below are pertinent available sampling, laboratory receipt and analysis dates.

Sample Number	Matrix	Sample Date	Rec'd. Date	Extract. Date	Analysis Date
9010220	Water	NA	NA	NA	061990
9010221	Water	NA	NA	NA	061990
9010236	Soil	NA	NA	NA	062190
9010237	Soil	NA	NA	NA	062190
9010238	Soil	NA	NA	NA	062190
9010239	Soil	NA	NA	NA	062190
9010240	Soil	NA	NA	NA	062190
9010241	Soil	NA	NA	NA	062190
9010242	Soil	NA	NA	NA	062190
9010243	Soil	NA	NA	NA	062190
9010245	Soil	NA	NA	NA	062190
9010246	Soil	NA	NA	NA	062290
9010247	Soil	NA	NA	NA	062290
9010248	Soil	NA	NA	NA	062290
9010646	Water	NA	NA	NA	062790
9010647	Water	NA	NA	NA	062790
BGS-1	Soil	061990	NA	NA	070290
BGS-2	Soil	061990	NA	NA	070290
BGS-3	Soil	061990	NA	NA	070290
BGS-4	Soil	061990	NA	NA	070290
9010648	Soil	NA	NA	NA	071290
9010649	Soil	NA	NA	NA	071290

Sample Number	Matrix	Sample Date	Rec'd. Date	Extract. Date	Analysis Date
9010650	Soil	NA	NA	NA	071290
9010651	Soil	NA	NA	NA	071290
9010652	Soil	NA	NA	NA	071290
9010653	Soil	NA	NA	NA	071290
9010654	Soil	NA	NA	NA	071290
9019540	Soil	NA	NA	NA	103090
9019541	Soil	NA	NA	NA	103090
9019542	Soil	NA	NA	NA	103090
9019543	Soil	NA	NA	NA	103190
9019544	Soil	NA	NA	NA	103090
9019545	Soil	NA	NA	NA	103090
9019546	Soil	NA	NA	NA	103090
9019547	Soil	NA	NA	NA	103090
9019548	Soil	NA	NA	NA	103090
9019549	Soil	NA	NA	NA	103090

NA - Information not available.

No qualifiers were applied to the data based on holding times.

2. GC/MS Tuning

GC/MS Tuning Checks (DFTPP) were performed at the beginning of each 12 hour period of sample analyses meeting the criteria for frequency except for analyses on 06/21-22/90. No information for a tuning check analysis was submitted for the 06/21-22/90 sample analyses, therefore, the sample data could not be evaluated regarding the tuning check results.

The provided summary for each tuning performance determined that the tuning criteria were met. However, tabulated mass data were not submitted to fully verify the calculated results reported on the summaries.

3. Initial Calibration

Initial calibrations were performed on 06/07/90, 07/12/90 and 10/15/90. Standards of 20, 50, 100, 150, and 200 ng were analyzed. This resulted in a quantitation limit (QL) in terms of absolute amount injected of 20 ng for all analytes. The minimum average relative response factor (RRF) requirement of 0.05 specified in the Functional Guidelines for all analytes was met except for benzidine for the 06/07/90 initial calibration which resulted with 0.02 average RRF. The 10/15/90 initial calibration did not detect benzidine in all standards, therefore, no quantitation of benzidine occurred for sample analyses conducted on 10/30/90 and 10/31/90.

The benzidine non-detected results associated with the 06/07/90 initial calibration are qualified as rejected, "R", detected results are

qualified as estimates, "J". The following sample results for benzidine were qualified:

Rejected, **R:**

9010220	9010221	9010236	9010237	9010238	9010239
9010240	9010241	9010242	9010243	9010245	9010246
9010247	9010248	9010646	BGS-1	BGS-2	BGS-3
BGS-4					

Estimated, **J:**

9010647

The percent relative standard deviation (%RSD) criteria for the RRFs were met for all analytes (≤ 30%) except for bis(2-ethylhexyl)phthalate (07/12/90) and isophorone (10/15/90). The %RSDs were 33% and 32%, respectively. No qualifiers were applied to the data based on these %RSDs being slightly out of criteria.

The reported RRF values were verified from the raw data. Calculations were correct and no transcription errors were determined.

4. Continuing Calibration

A continuing calibration standard (CCS) analysis was performed for each 12 hour period of sample analyses which meets the criterion for frequency, however, no data verifying that a CCS analysis was performed for samples analyzed on 06/21/90 and 06/22/90 were submitted. The associated sample results could not be evaluated based on CCS performance.

RRF percent differences (%Ds) from the average initial RRFs met the criteria for all target compounds (≤ 25%) except for the following whose associated sample results were qualified as estimates, **"J/UJ"**:

Calibration Date	Analytes >25%D	%D
06/19/90	Acenaphthene	37
	3-Nitroaniline	-40
	4-Nitroaniline	-55
	Benzidine	48
	Pyrene	32
	Benzo(a)anthracene	33
	Chrysene	31
	Benzo(b)fluoranthene	-46
	Benzo(k)fluoranthene	-51
06/27/90	Acenaphthylene	44
	3-Nitroaniline	-26
	4-Nitroaniline	-41
	Butylbenzylphthalate	-47
	3,3'-Dichlorobenzidine	-35
	bis(2-Ethylhexyl)phthalate	-52
	Benzo(k)fluoranthene	27

07/02/90	Benzyl Alcohol	29
	Benzoic Acid	52
	Hexachlorocyclopentadiene	-64
	2-Chloronaphthalene	-49
	2,4-Dinitrophenol	36
	2,4-Dinitrotoluene	26
	4-Nitroaniline	26
	4,6-Dinitro-2-methylphenol	29
10/30/90	Benzyl Alcohol	35
	Pyrene	27
10/31/90	1,2-Dichlorobenzene	-27
	bis(2-Chloroisopropyl)ether	-43
	4-Methylphenol	-29
	N-Nitroso-di-n-propylamine	32
	Hexachloroethane	-28
	Isophorone	-35
	3,3'-Dichlorobenzidine	-34
	Benzo(a)anthracene	-29
	Indeno(1,2,3-cd)pyrene	-47
	Dibenz(a,h)anthracene	-47
	Benzo(ghi)perylene	-59

Non-detected sample results for analytes associated with a CCS with %Ds out of criteria but indicating an increase in sensitivity ("-" %D) were not qualified.

The reported RRF values were verified from the raw data. The minimum RRF criterion (0.05) was met for all analytes except for benzidine for CCSs on 06/19/90 and 06/27/90. Since the data were previously qualified based on the initial calibration performance, no further qualifications were applied.

Calculations were correct and no transcription errors were determined.

5. Blanks

Six method blanks were analyzed. The frequency criterion for method blanks was met. Background levels for all target analytes in the method blanks were below the QLs. In four of the method blanks analyzed, bis(2-ethylhexyl)phthalate and di-n-butylphthalate were detected up to 0.5 ng. Since no sample preparation information was available for this review, it is uncertain as to which method blanks are associated with the samples. Due to the ubiquitous nature of the phthalates and as according to the Functional Guidelines, all detected results for bis(2-ethylhexyl)phthalate and di-n-butylphthalate <5 ng are qualified as non-detected, "U", at the QL. The following samples were qualified accordingly:

9010237 9010239 9010242 9010246 9010247 9010248
9010646 9010647 9010649 9010654 9019541 9019547
9019549

6. Surrogate Recovery - Acceptable

The spike level for each base/neutral surrogates (nitrobenzene-d5, 2-fluorobiphenyl, p-terphenyl-d14) were assumed to be at 50 ng and for the acid surrogates (phenol-d5, 2-fluorophenol, 2,4,6-tribromophenol) 100 ng.

All surrogate recoveries for each sample analysis were within the Functional Guidelines criteria.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Samples 9010221, 9010246, 9010647, 9010653, 9010654, and 9019540 were used for MS/MSD analyses. The frequency criterion for MS/MSD analyses was met. All recoveries were within the criteria described in the Functional Guidelines except for the following:

Sample	Spiked Compound	% Recovery
9010221 MS/MSD	All	0
9010246 MS	Pentachlorophenol	1
	4-Nitrophenol	0
9010647 MS	1,2,4-Trichlorobenzene	32
	Acenaphthene	30
	1,4-Dichlorobenzene	30
9019540 MS	1,2,4-Trichlorobenzene	1
	Acenaphthene	19
	N-Nitroso-di-n-propylamine	14
	1,4-Dichlorobenzene	0
	Phenol	22
	2-Chlorophenol	9

The following MS/MSD relative percent difference (RPD) results were out of criteria:

Sample	Spiked Compound	RPD
9010647	1,2,4-Trichlorobenzene	38
	2,4-Dinitrotoluene	61
	1,4-Dichlorobenzene	34
9019540	1,2,4-Trichlorobenzene	174
	Acenaphthene	77
	N-Nitroso-di-n-propylamine	108
	1,4-Dichlorobenzene	200
	Phenol	64

2-Chlorophenol	119
4-Chloro-3-methylphenol	42

No sample data were qualified since it is unknown as to which samples are associated with the above MS/MSD analyses out of criteria. The results that are below the recovery criteria suggest the possibility of low bias in the sample data.

It is suspected by the reviewer that samples 9010221 MS and MSD were accidentally not spiked by the laboratory since the surrogate recoveries were acceptable. Therefore, the 0% recoveries should not influence the evaluation of the sample data.

8. Laboratory Control Sample - Not Applicable

Based on the information provided, a laboratory control sample (LCS) was not analyzed.

9. Internal Standards Performance

The data reported on the Internal Standard Area Summary (Form VIII) were verified with the raw data. Chromatograms and transcriptions were examined. The internal standard (IS) area counts and the retention time shifts for all sample analyses were acceptable except for the following samples which resulted in area counts not within the -50% to +100% of the associated CCS:

Sample	IS <-50%
9010220	Chrysene-d12, Perylene-d12
9010221	Perylene-d12
9010646	Naphthalene-d8
9010653	Chrysene-d12, Perylene-d12

Sample	IS >+100%
BGS-1	Acenaphthene-d10
9019549	Perylene-d12
9019542	Perylene-d12
9019546	Chrysene-d12, Perylene-d12

Associated sample results quantitated by ISs <-50% were qualified as estimates, **"J/UJ"**. Only detected associated sample results quantitated by ISs >+100% were qualified as estimates, **"J"**.

No data for CCS analyses on 06/21/90 and 06/22/90 were submitted, therefore, no IS evaluation could be performed for samples analyzed on these dates.

10. Compound Identification

No spectra were submitted with the raw data, therefore, the spectral matching criteria could not be applied. The detected sample results were not qualified based on the lack of spectral information.

All detected sample results were within relative retention time (RRT) windows established by the associated CCS.

11. Compound Quantitation and Detection Limits

The raw data was verified with the reported results. Calculations were correct. All samples and blanks' results were quantitated against an updated daily calibration standard, however, verification could not be performed for analyses on 06/21/90 and 06/22/90 since no CCS data was provided. Analytes detected below the QL were qualified as estimates, "J", by the reviewer.

No sample size information was provided for this review, therefore, no evaluation of detection limits could be performed.

12. Tentatively Identified Compounds - Not Applicable

No raw data associated with Tentatively Identified Compound (TIC) analysis were submitted. It does not appear that the laboratory had performed any TIC analyses.

13. System Performance

Based on the chromatographic response to the absolute amounts of analytes injected, the GC/MS system used for the analyses operated with satisfactory sensitivity.

14. Laboratory Contact

The laboratory was not contacted for this review.

15. Data Use - Acceptable

The data, as qualified, is acceptable for use.

DATA QUALIFIER DEFINITIONS

U- The analyte was analyzed for and is not present above the level of the associated value. The associated numerical value indicates the approximate concentration necessary to detect the analyte in this sample.

If a decision requires quantitation of the analyte below the associated numerical level, reanalysis or alternative analytical methods should be considered. The technical staff is available to discuss available options.

J- The analyte was analyzed for and was positively identified, but the associated numerical value may not be consistent with the amount actually present in the environmental sample. The data should be seriously considered for decision making and are usable for many purposes.

A subscript may be appended to the "J" that indicates which of the following quality control criteria were not met:

1 Blank contamination: indicates possible high bias and/or false positives.

2 Calibration range exceeded: indicates possible low bias.

3 Holding times not met: indicates low bias for most analytes with the exception of common laboratory contaminants and chlorinated ethenes (i.e.: trichloroethene, 1,1-dichloroethene, vinyl chloride).

4 Other QC outside control limits: bias not readily determined.

R- The data are unusable for all purposes. The analyte was analyzed for, but the presence or absence of the analyte has not been verified.

Resampling and reanalysis are necessary to confirm or deny the presence of the analyte.

UJ - A combination of the "U" and "J" qualifier. The analyte was analyzed for and was not present above the level of the associated value. The associated numerical value may not accurately or precisely represent the concentration necessary to detect the analyte in this sample.

If a decision requires quantitation of the analyte close to the associated numerical level, reanalysis or alternative analytical methods should be considered.

N- The analysis indicates that an analyte is present, and there are strong indications that the identity is correct.

Confirmation of the analyte requires further analysis.

NJ- A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

A subscript may be appended to the "NJ" that indicates which of the following situations applies:

1 DDT/Endrin breakdown evident.

2 Interference from other sample components.

3 **Non-Target Compound List** (TCL) compounds (Confirmation is necessary using specific target compound methodology to accurately determine the concentration and identity of the detected compound).

4 A confirmation analysis was missing or quality control criteria were not met for the confirmation analysis.

NOTE: Data users are encouraged to contact their Regional representative within ESD to clarify or obtain further information on the appropriate use of analytical data.

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Absolute Amount in Injected Volume (ng)			
	9010220	9010221	9010236	9010237
N-Nitrosodimethylamine	20 U	20 U	20 U	20 U
Phenol	20 U	20 U	20 U	20 U
bis(2-Chloroethyl)ether	20 U	20 U	20 U	20 U
2-Chlorophenol	20 U	20 U	20 U	20 U
1,3-Dichlorobenzene	20 U	20 U	20 U	20 U
1,4-Dichlorobenzene	20 U	20 U	20 U	20 U
Benzyl Alcohol	20 U	20 U	20 U	20 U
1,2-Dichlorobenzene	20 U	20 U	20 U	20 U
2-Methylphenol	20 U	20 U	20 U	20 U
bis(2-Chloroisopropyl)ether	20 U	20 U	20 U	20 U
4-Methylphenol	20 U	20 U	20 U	20 U
N-Nitroso-di-n-propylamine	20 U	20 U	20 U	20 U
Hexachloroethane	20 U	20 U	20 U	20 U
Nitrobenzene	20 U	20 U	20 U	20 U
Isophorone	20 U	20 U	20 U	20 U
2-Nitrophenol	20 U	20 U	20 U	20 U
2,4-Dimethylphenol	20 U	20 U	20 U	20 U
Benzoic Acid	20 U	20 U	20 U	20 U
bis(2-Chloroethoxy)methane	20 U	20 U	20 U	20 U
2,4-Dichlorophenol	20 U	20 U	20 U	20 U
1,2,4-Trichlorobenzene	20 U	20 U	20 U	20 U
Naphthalene	20 U	20 U	20 U	20 U
4-Chloroaniline	20 U	20 U	20 U	20 U
Hexachlorobutadiene	20 U	20 U	20 U	20 U
4-Chloro-3-methylphenol	20 U	20 U	20 U	20 U
2-Methylnaphthalene	20 U	20 U	20 U	20 U
Hexachlorocyclopentadiene	20 U	20 U	20 U	20 U
2,4,6-Trichlorophenol	20 U	20 U	20 U	20 U
2,4,5-Trichlorophenol	20 U	20 U	20 U	20 U
2-Chloronaphthalene	20 U	20 U	20 U	20 U
2-Nitroaniline	20 U	20 U	20 U	20 U
Dimethylphthalate	20 U	20 U	20 U	20 U
Acenaphthylene	20 U	20 U	20 U	20 U
3-Nitroaniline	20 U	20 U	20 U	20 U
Acenaphthene	20 UJ	20 UJ	20 U	20 U
2,4-Dinitrophenol	20 U	20 U	20 U	20 U
4-Nitrophenol	20 U	20 U	20 U	20 U
Dibenzofuran	20 U	20 U	20 U	20 U
2,6-Dinitrotoluene	20 U	20 U	20 U	20 U
2,4-Dinitrotoluene	20 U	20 U	20 U	20 U
Diethylphthalate	20 U	20 U	20 U	20 U
4-Chlorophenyl-phenylether	20 U	20 U	20 U	20 U
Fluorene	20 U	20 U	20 U	20 U
4-Nitroaniline	20 U	20 U	20 U	20 U

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Absolute Amount in Injected Volume (ng)			
	9010220	9010221	9010236	9010237
4,6-Dinitro-2-methylphenol	20 U	20 U	20 U	20 U
N-Nitrosodiphenylamine	20 U	20 U	20 U	20 U
1,2-Diphenylhydrazine	20 U	20 U	20 U	20 U
4-Bromophenyl-phenylether	20 U	20 U	20 U	20 U
Pentachlorophenol	20 U	20 U	20 U	20 U
Phenanthrene	20 U	20 U	20 U	20 U
Anthracene	20 U	20 U	20 U	20 U
Di-n-butylphthalate	20 U	20 U	20 U	20 U
Hexachlorobenzene	20 U	20 U	20 U	20 U
Fluoranthene	20 U	20 U	20 U	20 U
Benzidine	R	R	R	R
Pyrene	20 UJ	20 UJ	20 U	20 U
Butylbenzylphthalate	20 UJ	20 U	20 U	20 U
3,3'-Dichlorobenzidine	20 UJ	20 U	20 U	20 U
Benzo(a)anthracene	20 UJ	20 UJ	20 U	20 U
bis(2-Ethylhexyl)phthalate	20 UJ	20 U	35	20 U
Chrysene	20 UJ	20 UJ	20 U	20 U
Di-n-octylphthalate	20 UJ	20 UJ	12 J	20 U
Benzo(b)fluoranthene	20 UJ	20 UJ	20 U	20 U
Benzo(k)fluoranthene	20 UJ	20 UJ	20 U	20 U
Benzo(a)pyrene	20 UJ	20 UJ	20 U	20 U
Indeno(1,2,3-cd)pyrene	20 UJ	20 UJ	20 U	20 U
Dibenz(a,h)anthracene	20 UJ	20 UJ	20 U	20 U
Benzo(g,h,i)perylene	20 UJ	20 UJ	20 U	20 U

U - Not detected. Value is the quantitation limit.
UJ - Not detected. Quantitation limit is qualified as an estimate.
J - Detected result is qualified as an estimate.
R - Data rejected.

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Absolute Amount in Injected Volume (ng)			
	9010238	9010239	9010240	9010241
N-Nitrosodimethylamine	20 U	20 U	20 U	20 U
Phenol	20 U	20 U	20 U	20 U
bis(2-Chloroethyl)ether	20 U	20 U	20 U	20 U
2-Chlorophenol	20 U	20 U	20 U	20 U
1,3-Dichlorobenzene	20 U	20 U	20 U	20 U
1,4-Dichlorobenzene	20 U	20 U	20 U	20 U
Benzyl Alcohol	20 U	20 U	20 U	20 U
1,2-Dichlorobenzene	20 U	20 U	20 U	20 U
2-Methylphenol	20 U	20 U	20 U	20 U
bis(2-Chloroisopropyl)ether	20 U	20 U	20 U	20 U
4-Methylphenol	20 U	20 U	20 U	20 U
N-Nitroso-di-n-propylamine	20 U	20 U	20 U	20 U
Hexachloroethane	20 U	20 U	20 U	20 U
Nitrobenzene	20 U	20 U	20 U	20 U
Isophorone	20 U	20 U	20 U	20 U
2-Nitrophenol	20 U	20 U	20 U	20 U
2,4-Dimethylphenol	20 U	20 U	20 U	20 U
Benzoic Acid	20 U	20 U	20 U	20 U
bis(2-Chloroethoxy)methane	20 U	20 U	20 U	20 U
2,4-Dichlorophenol	20 U	20 U	20 U	20 U
1,2,4-Trichlorobenzene	20 U	20 U	20 U	20 U
Naphthalene	20 U	20 U	20 U	20 U
4-Chloroaniline	20 U	20 U	20 U	20 U
Hexachlorobutadiene	20 U	20 U	20 U	20 U
4-Chloro-3-methylphenol	20 U	20 U	20 U	20 U
2-Methylnaphthalene	20 U	20 U	20 U	20 U
Hexachlorocyclopentadiene	20 U	20 U	20 U	20 U
2,4,6-Trichlorophenol	20 U	20 U	20 U	20 U
2,4,5-Trichlorophenol	20 U	20 U	20 U	20 U
2-Chloronaphthalene	20 U	20 U	20 U	20 U
2-Nitroaniline	20 U	20 U	20 U	20 U
Dimethylphthalate	20 U	20 U	20 U	20 U
Acenaphthylene	20 U	20 U	20 U	20 U
3-Nitroaniline	20 U	20 U	20 U	20 U
Acenaphthene	20 U	20 U	20 U	20 U
2,4-Dinitrophenol	20 U	20 U	20 U	20 U
4-Nitrophenol	20 U	20 U	20 U	20 U
Dibenzofuran	20 U	20 U	20 U	20 U
2,6-Dinitrotoluene	20 U	20 U	20 U	20 U
2,4-Dinitrotoluene	20 U	20 U	20 U	20 U
Diethylphthalate	20 U	20 U	20 U	20 U
4-Chlorophenyl-phenylether	20 U	20 U	20 U	20 U
Fluorene	20 U	20 U	20 U	20 U
4-Nitroaniline	20 U	20 U	20 U	20 U

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Compound	Absolute Amount in Injected Volume (ng)			
	9010238	9010239	9010240	9010241
4,6-Dinitro-2-methylphenol	20 U	20 U	20 U	20 U
N-Nitrosodiphenylamine	20 U	20 U	20 U	20 U
1,2-Diphenylhydrazine	20 U	20 U	20 U	20 U
4-Bromophenyl-phenylether	20 U	20 U	20 U	20 U
Pentachlorophenol	20 U	20 U	20 U	20 U
Phenanthrene	20 U	20 U	20 U	20 U
Anthracene	20 U	20 U	20 U	20 U
Di-n-butylphthalate	20 U	20 U	20 U	20 U
Hexachlorobenzene	20 U	20 U	20 U	20 U
Fluoranthene	20 U	20 U	20 U	20 U
Benzidine	R	R	R	R
Pyrene	20 U	20 U	20 U	20 U
Butylbenzylphthalate	20 U	20 U	20 U	20 U
3,3'-Dichlorobenzidine	20 U	20 U	20 U	20 U
Benzo(a)anthracene	20 U	20 U	20 U	20 U
bis(2-Ethylhexyl)phthalate	29	14 J	20 U	62
Chrysene	20 U	20 U	20 U	20 U
Di-n-octylphthalate	8.3 J	20 U	20 U	16 J
Benzo(b)fluoranthene	20 U	20 U	20 U	20 U
Benzo(k)fluoranthene	20 U	20 U	20 U	20 U
Benzo(a)pyrene	20 U	20 U	20 U	20 U
Indeno(1,2,3-cd)pyrene	20 U	20 U	20 U	20 U
Dibenz(a,h)anthracene	20 U	20 U	20 U	20 U
Benzo(g,h,i)perylene	20 U	20 U	20 U	20 U

U - Not detected. Value is the quantitation limit.
UJ - Not detected. Quantitation limit is qualified as an estimate.
J - Detected result is qualified as an estimate.
R - Data rejected.

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Absolute Amount in Injected Volume (ng)			
	9010242	9010243	9010245	9010246
N-Nitrosodimethylamine	20 U	20 U	20 U	20 U
Phenol	20 U	20 U	20 U	20 U
bis(2-Chloroethyl)ether	20 U	20 U	20 U	20 U
2-Chlorophenol	20 U	20 U	20 U	20 U
1,3-Dichlorobenzene	20 U	20 U	20 U	20 U
1,4-Dichlorobenzene	20 U	20 U	20 U	20 U
Benzyl Alcohol	20 U	20 U	20 U	20 U
1,2-Dichlorobenzene	20 U	20 U	20 U	20 U
2-Methylphenol	20 U	20 U	20 U	20 U
bis(2-Chloroisopropyl)ether	20 U	20 U	20 U	20 U
4-Methylphenol	20 U	20 U	20 U	20 U
N-Nitroso-di-n-propylamine	20 U	20 U	20 U	20 U
Hexachloroethane	20 U	20 U	20 U	20 U
Nitrobenzene	20 U	20 U	20 U	20 U
Isophorone	20 U	20 U	20 U	20 U
2-Nitrophenol	20 U	20 U	20 U	20 U
2,4-Dimethylphenol	20 U	20 U	20 U	20 U
Benzoic Acid	20 U	20 U	20 U	20 U
bis(2-Chloroethoxy)methane	20 U	20 U	20 U	20 U
2,4-Dichlorophenol	20 U	20 U	20 U	20 U
1,2,4-Trichlorobenzene	20 U	20 U	20 U	20 U
Naphthalene	20 U	20 U	20 U	20 U
4-Chloroaniline	20 U	20 U	20 U	20 U
Hexachlorobutadiene	20 U	20 U	20 U	20 U
4-Chloro-3-methylphenol	20 U	20 U	20 U	20 U
2-Methylnaphthalene	20 U	20 U	20 U	20 U
Hexachlorocyclopentadiene	20 U	20 U	20 U	20 U
2,4,6-Trichlorophenol	20 U	20 U	20 U	20 U
2,4,5-Trichlorophenol	20 U	20 U	20 U	20 U
2-Chloronaphthalene	20 U	20 U	20 U	20 U
2-Nitroaniline	20 U	20 U	20 U	20 U
Dimethylphthalate	20 U	20 U	20 U	20 U
Acenaphthylene	20 U	20 U	20 U	20 U
3-Nitroaniline	20 U	20 U	20 U	20 U
Acenaphthene	20 U	20 U	20 U	20 U
2,4-Dinitrophenol	20 U	20 U	20 U	20 U
4-Nitrophenol	20 U	20 U	20 U	20 U
Dibenzofuran	20 U	20 U	20 U	20 U
2,6-Dinitrotoluene	20 U	20 U	20 U	20 U
2,4-Dinitrotoluene	20 U	20 U	20 U	20 U
Diethylphthalate	20 U	20 U	20 U	20 U
4-Chlorophenyl-phenylether	20 U	20 U	20 U	20 U
Fluorene	20 U	20 U	20 U	20 U
4-Nitroaniline	20 U	20 U	20 U	20 U

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Absolute Amount in Injected Volume (ng)			
	9010242	9010243	9010245	9010246
4,6-Dinitro-2-methylphenol	20 U	20 U	20 U	20 U
N-Nitrosodiphenylamine	20 U	20 U	20 U	20 U
1,2-Diphenylhydrazine	20 U	20 U	20 U	20 U
4-Bromophenyl-phenylether	20 U	20 U	20 U	20 U
Pentachlorophenol	20 U	20 U	20 U	20 U
Phenanthrene	20 U	20 U	20 U	20 U
Anthracene	20 U	20 U	20 U	20 U
Di-n-butylphthalate	20 U	20 U	10 J	20 U
Hexachlorobenzene	20 U	20 U	20 U	20 U
Fluoranthene	20 U	20 U	20 U	20 U
Benzidine	R	R	R	R
Pyrene	20 U	20 U	20 U	20 U
Butylbenzylphthalate	20 U	20 U	20 U	20 U
3,3'-Dichlorobenzidine	20 U	20 U	20 U	20 U
Benzo(a)anthracene	20 U	20 U	20 U	20 U
bis(2-Ethylhexyl)phthalate	20 U	58	20 U	20 U
Chrysene	20 U	20 U	20 U	20 U
Di-n-octylphthalate	20 U	3.6 J	20 U	20 U
Benzo(b)fluoranthene	20 U	20 U	20 U	20 U
Benzo(k)fluoranthene	20 U	20 U	20 U	20 U
Benzo(a)pyrene	20 U	20 U	20 U	20 U
Indeno(1,2,3-cd)pyrene	20 U	20 U	20 U	20 U
Dibenz(a,h)anthracene	20 U	20 U	20 U	20 U
Benzo(g,h,i)perylene	20 U	20 U	20 U	20 U

U - Not detected. Value is the quantitation limit.
UJ - Not detected. Quantitation limit is qualified as an estimate.
J - Detected result is qualified as an estimate.
R - Data rejected.

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Absolute Amount in Injected Volume (ng)			
	9010247	9010248	9010646	9010647
N-Nitrosodimethylamine	20 U	20 U	20 U	20 U
Phenol	20 U	20 U	20 U	20 U
bis(2-Chloroethyl)ether	20 U	20 U	20 U	20 U
2-Chlorophenol	20 U	20 U	20 U	20 U
1,3-Dichlorobenzene	20 U	20 U	20 U	20 U
1,4-Dichlorobenzene	20 U	20 U	20 U	20 U
Benzyl Alcohol	20 U	20 U	20 U	20 U
1,2-Dichlorobenzene	20 U	20 U	20 U	20 U
2-Methylphenol	20 U	20 U	20 U	20 U
bis(2-Chloroisopropyl)ether	20 U	20 U	20 U	20 U
4-Methylphenol	20 U	20 U	20 U	20 U
N-Nitroso-di-n-propylamine	20 U	20 U	20 U	20 U
Hexachloroethane	20 U	20 U	20 U	20 U
Nitrobenzene	20 U	20 U	20 UJ	20 U
Isophorone	20 U	20 U	20 UJ	20 U
2-Nitrophenol	20 U	20 U	20 UJ	20 U
2,4-Dimethylphenol	20 U	20 U	20 UJ	20 U
Benzoic Acid	20 U	20 U	20 UJ	20 U
bis(2-Chloroethoxy)methane	20 U	20 U	20 UJ	20 U
2,4-Dichlorophenol	20 U	20 U	20 UJ	20 U
1,2,4-Trichlorobenzene	20 U	20 U	20 UJ	20 U
Naphthalene	20 U	20 U	20 UJ	20 U
4-Chloroaniline	20 U	20 U	20 UJ	20 U
Hexachlorobutadiene	20 U	20 U	20 UJ	20 U
4-Chloro-3-methylphenol	20 U	20 U	20 UJ	20 U
2-Methylnaphthalene	20 U	20 U	20 UJ	20 U
Hexachlorocyclopentadiene	20 U	20 U	20 U	20 U
2,4,6-Trichlorophenol	20 U	20 U	20 U	20 U
2,4,5-Trichlorophenol	20 U	20 U	20 U	20 U
2-Chloronaphthalene	20 U	20 U	20 U	20 U
2-Nitroaniline	20 U	20 U	20 U	20 U
Dimethylphthalate	20 U	20 U	20 U	20 U
Acenaphthylene	20 U	20 U	20 UJ	20 UJ
3-Nitroaniline	20 U	20 U	20 U	20 U
Acenaphthene	20 U	20 U	20 U	20 U
2,4-Dinitrophenol	20 U	20 U	20 U	20 U
4-Nitrophenol	20 U	20 U	20 U	20 U
Dibenzofuran	20 U	20 U	20 U	20 U
2,6-Dinitrotoluene	20 U	20 U	20 U	20 U
2,4-Dinitrotoluene	20 U	20 U	20 U	20 U
Diethylphthalate	20 U	20 U	2.7 J	20 U
4-Chlorophenyl-phenylether	20 U	20 U	20 U	20 U
Fluorene	20 U	20 U	20 U	20 U
4-Nitroaniline	20 U	20 U	20 U	20 U

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SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Absolute Amount in Injected Volume (ng)			
	9010247	9010248	9010646	9010647
4,6-Dinitro-2-methylphenol	20 U	20 U	20 U	20 U
N-Nitrosodiphenylamine	20 U	20 U	20 U	20 U
1,2-Diphenylhydrazine	20 U	20 U	20 U	20 U
4-Bromophenyl-phenylether	20 U	20 U	20 U	20 U
Pentachlorophenol	20 U	20 U	20 U	20 U
Phenanthrene	20 U	20 U	20 U	20 U
Anthracene	20 U	20 U	20 U	20 U
Di-n-butylphthalate	20 U	20 U	20 U	20 U
Hexachlorobenzene	20 U	20 U	20 U	20 U
Fluoranthene	20 U	20 U	20 U	20 U
Benzidine	R	R	R	R
Pyrene	20 U	20 U	20 U	20 U
Butylbenzylphthalate	20 U	20 U	20 U	20 U
3,3'-Dichlorobenzidine	20 U	20 U	20 U	20 U
Benzo(a)anthracene	20 U	20 U	20 U	20 U
bis(2-Ethylhexyl)phthalate	20 U	20 U	5.3 J	20 U
Chrysene	20 U	1.4 J	20 U	20 U
Di-n-octylphthalate	20 U	20 U	3.0 J	1.1 J
Benzo(b)fluoranthene	20 U	1.7 J	20 U	20 U
Benzo(k)fluoranthene	20 U	2.6 J	20 UJ	20 UJ
Benzo(a)pyrene	20 U	20 U	20 U	20 U
Indeno(1,2,3-cd)pyrene	20 U	20 U	20 U	20 U
Dibenz(a,h)anthracene	20 U	20 U	20 U	20 U
Benzo(g,h,i)perylene	20 U	20 U	20 U	20 U

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J - Detected result is qualified as an estimate.
R - Data rejected.

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Absolute Amount in Injected Volume (ng) BGS-1	BGS-2	BGS-3	BGS-4
N-Nitrosodimethylamine	20 U	20 U	20 U	20 U
Phenol	20 U	20 U	20 U	20 U
bis(2-Chloroethyl)ether	20 U	20 U	20 U	20 U
2-Chlorophenol	20 U	20 U	20 U	20 U
1,3-Dichlorobenzene	20 U	20 U	20 U	20 U
1,4-Dichlorobenzene	20 U	20 U	20 U	20 U
Benzyl Alcohol	20 UJ	20 UJ	20 UJ	20 UJ
1,2-Dichlorobenzene	20 U	20 U	20 U	20 U
2-Methylphenol	20 U	20 U	20 U	20 U
bis(2-Chloroisopropyl)ether	20 U	20 U	20 U	20 U
4-Methylphenol	20 U	20 U	20 U	20 U
N-Nitroso-di-n-propylamine	20 U	20 U	20 U	20 U
Hexachloroethane	20 U	20 U	20 U	20 U
Nitrobenzene	20 U	20 U	20 U	20 U
Isophorone	20 U	20 U	20 U	20 U
2-Nitrophenol	20 U	20 U	20 U	20 U
2,4-Dimethylphenol	20 U	20 U	20 U	20 U
Benzoic Acid	20 UJ	20 UJ	20 UJ	20 UJ
bis(2-Chloroethoxy)methane	20 U	20 U	20 U	20 U
2,4-Dichlorophenol	20 U	20 U	20 U	20 U
1,2,4-Trichlorobenzene	20 U	20 U	20 U	20 U
Naphthalene	20 U	20 U	20 U	20 U
4-Chloroaniline	20 U	20 U	20 U	20 U
Hexachlorobutadiene	20 U	20 U	20 U	20 U
4-Chloro-3-methylphenol	20 U	20 U	20 U	20 U
2-Methylnaphthalene	20 U	20 U	20 U	20 U
Hexachlorocyclopentadiene	20 U	20 U	20 U	20 U
2,4,6-Trichlorophenol	20 U	20 U	20 U	20 U
2,4,5-Trichlorophenol	20 U	20 U	20 U	20 U
2-Chloronaphthalene	20 U	20 U	20 U	20 U
2-Nitroaniline	20 U	20 U	20 U	20 U
Dimethylphthalate	20 U	20 U	20 U	20 U
Acenaphthylene	20 U	20 U	20 U	20 U
3-Nitroaniline	20 U	20 U	20 U	20 U
Acenaphthene	20 U	20 U	20 U	20 U
2,4-Dinitrophenol	20 UJ	20 UJ	20 UJ	20 UJ
4-Nitrophenol	20 U	20 U	20 U	20 U
Dibenzofuran	20 U	20 U	20 U	20 U
2,6-Dinitrotoluene	20 U	20 U	20 U	20 U
2,4-Dinitrotoluene	20 UJ	20 UJ	20 UJ	20 UJ
Diethylphthalate	20 U	20 U	20 U	20 U
4-Chlorophenyl-phenylether	20 U	20 U	20 U	20 U
Fluorene	20 U	20 U	20 U	20 U
4-Nitroaniline	20 UJ	20 UJ	20 UJ	20 UJ

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Absolute Amount in Injected Volume (ng) BGS-1	BGS-2	BGS-3	BGS-4
4,6-Dinitro-2-methylphenol	20 UJ	20 UJ	20 UJ	20 UJ
N-Nitrosodiphenylamine	20 U	20 U	20 U	20 U
1,2-Diphenylhydrazine	20 U	20 U	20 U	20 U
4-Bromophenyl-phenylether	20 U	20 U	20 U	20 U
Pentachlorophenol	20 U	20 U	20 U	20 U
Phenanthrene	20 U	20 U	20 U	20 U
Anthracene	20 U	20 U	20 U	20 U
Di-n-butylphthalate	20 U	20 U	20 U	20 U
Hexachlorobenzene	20 U	20 U	20 U	20 U
Fluoranthene	20 U	20 U	20 U	20 U
Benzidine	R	R	R	R
Pyrene	20 U	20 U	20 U	20 U
Butylbenzylphthalate	20 U	20 U	20 U	20 U
3,3'-Dichlorobenzidine	20 U	20 U	20 U	20 U
Benzo(a)anthracene	20 U	20 U	20 U	20 U
bis(2-Ethylhexyl)phthalate	20 U	20 U	20 U	20 U
Chrysene	20 U	20 U	20 U	20 U
Di-n-octylphthalate	20 U	20 U	20 U	20 U
Benzo(b)fluoranthene	20 U	20 U	20 U	20 U
Benzo(k)fluoranthene	20 U	20 U	20 U	20 U
Benzo(a)pyrene	20 U	20 U	20 U	20 U
Indeno(1,2,3-cd)pyrene	20 U	20 U	20 U	20 U
Dibenz(a,h)anthracene	20 U	20 U	20 U	20 U
Benzo(g,h,i)perylene	20 U	20 U	20 U	20 U

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UJ - Not detected. Quantitation limit is qualified as an estimate.
J - Detected result is qualified as an estimate.
R - Data rejected.

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Absolute Amount in Injected Volume (ng) 9010648	9010649	9010650	9010651
N-Nitrosodimethylamine	20 U	20 U	20 U	20 U
Phenol	20 U	20 U	20 U	20 U
bis(2-Chloroethyl)ether	20 U	20 U	20 U	20 U
2-Chlorophenol	20 U	20 U	20 U	20 U
1,3-Dichlorobenzene	20 U	20 U	20 U	20 U
1,4-Dichlorobenzene	20 U	20 U	20 U	20 U
Benzyl Alcohol	20 U	20 U	20 U	20 U
1,2-Dichlorobenzene	20 U	20 U	20 U	20 U
2-Methylphenol	20 U	20 U	20 U	20 U
bis(2-Chloroisopropyl)ether	20 U	20 U	20 U	20 U
4-Methylphenol	20 U	20 U	20 U	20 U
N-Nitroso-di-n-propylamine	20 U	20 U	20 U	20 U
Hexachloroethane	20 U	20 U	20 U	20 U
Nitrobenzene	20 U	20 U	20 U	20 U
Isophorone	20 U	20 U	20 U	20 U
2-Nitrophenol	20 U	20 U	20 U	20 U
2,4-Dimethylphenol	20 U	20 U	20 U	20 U
Benzoic Acid	20 U	20 U	20 U	20 U
bis(2-Chloroethoxy)methane	20 U	20 U	20 U	20 U
2,4-Dichlorophenol	20 U	20 U	20 U	20 U
1,2,4-Trichlorobenzene	20 U	20 U	20 U	20 U
Naphthalene	20 U	20 U	20 U	20 U
4-Chloroaniline	20 U	20 U	20 U	20 U
Hexachlorobutadiene	20 U	20 U	20 U	20 U
4-Chloro-3-methylphenol	20 U	20 U	20 U	20 U
2-Methylnaphthalene	20 U	20 U	20 U	20 U
Hexachlorocyclopentadiene	20 U	20 U	20 U	20 U
2,4,6-Trichlorophenol	20 U	20 U	20 U	20 U
2,4,5-Trichlorophenol	20 U	20 U	20 U	20 U
2-Chloronaphthalene	20 U	20 U	20 U	20 U
2-Nitroaniline	20 U	20 U	20 U	20 U
Dimethylphthalate	20 U	20 U	20 U	20 U
Acenaphthylene	20 U	20 U	20 U	20 U
3-Nitroaniline	20 U	20 U	20 U	20 U
Acenaphthene	20 U	20 U	20 U	20 U
2,4-Dinitrophenol	20 U	20 U	20 U	20 U
4-Nitrophenol	20 U	20 U	20 U	20 U
Dibenzofuran	20 U	20 U	20 U	20 U
2,6-Dinitrotoluene	20 U	20 U	20 U	20 U
2,4-Dinitrotoluene	20 U	20 U	20 U	20 U
Diethylphthalate	20 U	20 U	20 U	20 U
4-Chlorophenyl-phenylether	20 U	20 U	20 U	20 U
Fluorene	20 U	20 U	20 U	20 U
4-Nitroaniline	20 U	20 U	20 U	20 U

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Absolute Amount in Injected Volume (ng)			
	9010648	9010649	9010650	9010651
4,6-Dinitro-2-methylphenol	20 U	20 U	20 U	20 U
N-Nitrosodiphenylamine	20 U	20 U	20 U	20 U
1,2-Diphenylhydrazine	20 U	20 U	20 U	20 U
4-Bromophenyl-phenylether	20 U	20 U	20 U	20 U
Pentachlorophenol	20 U	20 U	20 U	20 U
Phenanthrene	20 U	20 U	20 U	20 U
Anthracene	20 U	20 U	20 U	20 U
Di-n-butylphthalate	20 U	20 U	20 U	20 U
Hexachlorobenzene	20 U	20 U	20 U	20 U
Fluoranthene	20 U	20 U	20 U	20 U
Benzidine	20 U	20 U	20 U	20 U
Pyrene	20 U	20 U	20 U	20 U
Butylbenzylphthalate	20 U	20 U	20 U	20 U
3,3'-Dichlorobenzidine	20 U	20 U	20 U	20 U
Benzo(a)anthracene	20 U	20 U	20 U	20 U
bis(2-Ethylhexyl)phthalate	20 U	20 U	20 U	20 U
Chrysene	20 U	20 U	20 U	20 U
Di-n-octylphthalate	20 U	20 U	20 U	20 U
Benzo(b)fluoranthene	20 U	20 U	20 U	20 U
Benzo(k)fluoranthene	20 U	20 U	20 U	20 U
Benzo(a)pyrene	20 U	20 U	20 U	20 U
Indeno(1,2,3-cd)pyrene	20 U	20 U	20 U	20 U
Dibenz(a,h)anthracene	20 U	20 U	20 U	20 U
Benzo(g,h,i)perylene	20 U	20 U	20 U	20 U

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UJ - Not detected. Quantitation limit is qualified as an estimate.
J - Detected result is qualified as an estimate.

8-24-92

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Absolute Amount in Injected Volume (ng)			
	9010652	9010653	9010654	9019540
N-Nitrosodimethylamine	20 U	20 U	20 U	20 U
Phenol	20 U	20 U	20 U	20 U
bis(2-Chloroethyl)ether	20 U	20 U	20 U	20 U
2-Chlorophenol	20 U	20 U	20 U	20 U
1,3-Dichlorobenzene	20 U	20 U	20 U	20 U
1,4-Dichlorobenzene	20 U	20 U	20 U	20 U
Benzyl Alcohol	20 U	20 U	20 U	20 U
1,2-Dichlorobenzene	20 U	20 U	20 U	20 U
2-Methylphenol	20 U	20 U	20 U	20 U
bis(2-Chloroisopropyl)ether	20 U	20 U	20 U	20 U
4-Methylphenol	20 U	20 U	20 U	20 U
N-Nitroso-di-n-propylamine	20 U	20 U	20 U	20 U
Hexachloroethane	20 U	20 U	20 U	20 U
Nitrobenzene	20 U	20 U	20 U	20 U
Isophorone	20 U	20 U	20 U	20 U
2-Nitrophenol	20 U	20 U	20 U	20 U
2,4-Dimethylphenol	20 U	20 U	20 U	20 U
Benzoic Acid	20 U	20 U	20 U	20 U
bis(2-Chloroethoxy)methane	20 U	20 U	20 U	20 U
2,4-Dichlorophenol	20 U	20 U	20 U	20 U
1,2,4-Trichlorobenzene	20 U	20 U	20 U	20 U
Naphthalene	20 U	20 U	20 U	20 U
4-Chloroaniline	20 U	20 U	20 U	20 U
Hexachlorobutadiene	20 U	20 U	20 U	20 U
4-Chloro-3-methylphenol	20 U	20 U	20 U	20 U
2-Methylnaphthalene	20 U	20 U	20 U	20 U
Hexachlorocyclopentadiene	20 U	20 U	20 U	20 U
2,4,6-Trichlorophenol	20 U	20 U	20 U	20 U
2,4,5-Trichlorophenol	20 U	20 U	20 U	20 U
2-Chloronaphthalene	20 U	20 U	20 U	20 U
2-Nitroaniline	20 U	20 U	20 U	20 U
Dimethylphthalate	20 U	20 U	20 U	20 U
Acenaphthylene	20 U	20 U	20 U	20 U
3-Nitroaniline	20 U	20 U	20 U	20 U
Acenaphthene	20 U	20 U	20 U	20 U
2,4-Dinitrophenol	20 U	20 U	20 U	20 U
4-Nitrophenol	20 U	20 U	20 U	20 U
Dibenzofuran	20 U	20 U	20 U	20 U
2,6-Dinitrotoluene	20 U	20 U	20 U	20 U
2,4-Dinitrotoluene	20 U	20 U	20 U	20 U
Diethylphthalate	20 U	20 U	20 U	20 U
4-Chlorophenyl-phenylether	20 U	20 U	20 U	20 U
Fluorene	20 U	20 U	20 U	20 U
4-Nitroaniline	20 U	20 U	20 U	20 U

8-2-91

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Absolute Amount in Injected Volume (ng)			
	9010652	9010653	9010654	9019540
4,6-Dinitro-2-methylphenol	20 U	20 U	20 U	20 U
N-Nitrosodiphenylamine	20 U	20 U	20 U	20 U
1,2-Diphenylhydrazine	20 U	20 U	20 U	20 U
4-Bromophenyl-phenylether	20 U	20 U	20 U	20 U
Pentachlorophenol	20 U	20 U	20 U	20 U
Phenanthrene	20 U	20 U	20 U	20 U
Anthracene	20 U	20 U	20 U	20 U
Di-n-butylphthalate	20 U	20 U	20 U	20 U
Hexachlorobenzene	20 U	20 U	20 U	20 U
Fluoranthene	20 U	20 U	20 U	20 U
Benzidine	20 U	20 UJ	20 U	NA
Pyrene	20 U	20 UJ	20 U	20 UJ
Butylbenzylphthalate	20 U	20 UJ	20 U	20 U
3,3'-Dichlorobenzidine	20 U	20 UJ	20 U	20 U
Benzo(a)anthracene	20 U	20 UJ	20 U	20 U
bis(2-Ethylhexyl)phthalate	20 U	20 UJ	20 U	20 U
Chrysene	20 U	20 UJ	20 U	20 U
Di-n-octylphthalate	20 U	20 UJ	20 U	20 U
Benzo(b)fluoranthene	20 U	20 UJ	20 U	20 U
Benzo(k)fluoranthene	20 U	20 UJ	20 U	20 U
Benzo(a)pyrene	20 U	20 UJ	20 U	20 U
Indeno(1,2,3-cd)pyrene	20 U	20 UJ	20 U	20 U
Dibenz(a,h)anthracene	20 U	20 UJ	20 U	20 U
Benzo(g,h,i)perylene	20 U	20 UJ	20 U	20 U

U - Not detected. Value is the quantitation limit.
UJ - Not detected. Quantitation limit is qualified as an estimate.
J - Detected result is qualified as an estimate.
NA - Not analyzed.

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Absolute Amount in Injected Volume (ng)			
	9019541	9019542	9019543	9019544
N-Nitrosodimethylamine	20 U	20 U	20 U	20 U
Phenol	20 U	20 U	20 U	20 U
bis(2-Chloroethyl)ether	20 U	20 U	20 U	20 U
2-Chlorophenol	20 U	20 U	20 U	20 U
1,3-Dichlorobenzene	20 U	20 U	20 U	20 U
1,4-Dichlorobenzene	20 U	20 U	20 U	20 U
Benzyl Alcohol	20 UJ	20 UJ	20 U	20 UJ
1,2-Dichlorobenzene	20 U	20 U	20 U	20 U
2-Methylphenol	20 U	20 U	20 U	20 U
bis(2-Chloroisopropyl)ether	20 U	20 U	20 U	20 U
4-Methylphenol	20 U	20 U	20 U	20 U
N-Nitroso-di-n-propylamine	20 U	20 U	20 UJ	20 U
Hexachloroethane	20 U	20 U	20 U	20 U
Nitrobenzene	20 U	20 U	20 U	20 U
Isophorone	20 U	20 U	20 U	20 U
2-Nitrophenol	20 U	20 U	20 U	20 U
2,4-Dimethylphenol	20 U	20 U	20 U	20 U
Benzoic Acid	20 U	20 U	20 U	20 U
bis(2-Chloroethoxy)methane	20 U	20 U	20 U	20 U
2,4-Dichlorophenol	20 U	20 U	20 U	20 U
1,2,4-Trichlorobenzene	20 U	20 U	20 U	20 U
Naphthalene	20 U	20 U	20 U	20 U
4-Chloroaniline	20 U	20 U	20 U	20 U
Hexachlorobutadiene	20 U	20 U	20 U	20 U
4-Chloro-3-methylphenol	20 U	20 U	20 U	20 U
2-Methylnaphthalene	20 U	20 U	20 U	20 U
Hexachlorocyclopentadiene	20 U	20 U	20 U	20 U
2,4,6-Trichlorophenol	20 U	20 U	20 U	20 U
2,4,5-Trichlorophenol	20 U	20 U	20 U	20 U
2-Chloronaphthalene	20 U	20 U	20 U	20 U
2-Nitroaniline	20 U	20 U	20 U	20 U
Dimethylphthalate	20 U	20 U	20 U	20 U
Acenaphthylene	20 U	20 U	20 U	20 U
3-Nitroaniline	20 U	20 U	20 U	20 U
Acenaphthene	20 U	20 U	20 U	20 U
2,4-Dinitrophenol	20 U	20 U	20 U	20 U
4-Nitrophenol	20 U	20 U	20 U	20 U
Dibenzofuran	20 U	20 U	20 U	20 U
2,6-Dinitrotoluene	20 U	20 U	20 U	20 U
2,4-Dinitrotoluene	20 U	20 U	20 U	20 U
Diethylphthalate	20 U	20 U	20 U	20 U
4-Chlorophenyl-phenylether	20 U	20 U	20 U	20 U
Fluorene	20 U	20 U	20 U	20 U
4-Nitroaniline	20 U	20 U	20 U	20 U

8-24-90

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Absolute Amount in Injected Volume (ng)			
	9019541	9019542	9019543	9019544
4,6-Dinitro-2-methylphenol	20 U	20 U	20 U	20 U
N-Nitrosodiphenylamine	20 U	20 U	20 U	20 U
1,2-Diphenylhydrazine	20 U	20 U	20 U	20 U
4-Bromophenyl-phenylether	20 U	20 U	20 U	20 U
Pentachlorophenol	20 U	20 U	20 U	20 U
Phenanthrene	20 U	20 U	20 U	20 U
Anthracene	20 U	20 U	20 U	20 U
Di-n-butylphthalate	20 U	20 U	20 U	20 U
Hexachlorobenzene	20 U	20 U	20 U	20 U
Fluoranthene	20 U	20 U	20 U	20 U
Benzidine	NA	NA	NA	NA
Pyrene	20 UJ	20 UJ	20 U	20 UJ
Butylbenzylphthalate	20 U	20 U	20 U	20 U
3,3'-Dichlorobenzidine	20 U	20 U	20 U	20 U
Benzo(a)anthracene	20 U	20 U	20 U	20 U
bis(2-Ethylhexyl)phthalate	20 U	20 U	20 U	20 U
Chrysene	20 U	20 U	20 U	20 U
Di-n-octylphthalate	20 U	20 U	20 U	20 U
Benzo(b)fluoranthene	20 U	20 U	20 U	20 U
Benzo(k)fluoranthene	20 U	20 U	20 U	20 U
Benzo(a)pyrene	20 U	20 U	20 U	20 U
Indeno(1,2,3-cd)pyrene	20 U	20 U	20 U	20 U
Dibenz(a,h)anthracene	20 U	20 U	20 U	20 U
Benzo(g,h,i)perylene	20 U	20 U	20 U	20 U

U - Not detected. Value is the quantitation limit.
UJ - Not detected. Quantitation limit is qualified as an estimate.
J - Detected result is qualified as an estimate.
NA - Not analyzed.

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Absolute Amount in Injected Volume (ng)			
	9019545	9019546	9019547	9019548
N-Nitrosodimethylamine	20 U	20 U	20 U	20 U
Phenol	20 U	20 U	20 U	20 U
bis(2-Chloroethyl)ether	20 U	20 U	20 U	20 U
2-Chlorophenol	20 U	20 U	20 U	20 U
1,3-Dichlorobenzene	20 U	20 U	20 U	20 U
1,4-Dichlorobenzene	20 U	20 U	20 U	20 U
Benzyl Alcohol	20 UJ	20 UJ	20 UJ	20 UJ
1,2-Dichlorobenzene	20 U	20 U	20 U	20 U
2-Methylphenol	20 U	20 U	20 U	20 U
bis(2-Chloroisopropyl)ether	20 U	20 U	20 U	20 U
4-Methylphenol	20 U	20 U	20 U	20 U
N-Nitroso-di-n-propylamine	20 U	20 U	20 U	20 U
Hexachloroethane	20 U	20 U	20 U	20 U
Nitrobenzene	20 U	20 U	20 U	20 U
Isophorone	20 U	20 U	20 U	20 U
2-Nitrophenol	20 U	20 U	20 U	20 U
2,4-Dimethylphenol	20 U	20 U	20 U	20 U
Benzoic Acid	20 U	20 U	20 U	20 U
bis(2-Chloroethoxy)methane	20 U	20 U	20 U	20 U
2,4-Dichlorophenol	20 U	20 U	20 U	20 U
1,2,4-Trichlorobenzene	20 U	20 U	20 U	20 U
Naphthalene	20 U	20 U	20 U	20 U
4-Chloroaniline	20 U	20 U	20 U	20 U
Hexachlorobutadiene	20 U	20 U	20 U	20 U
4-Chloro-3-methylphenol	20 U	20 U	20 U	20 U
2-Methylnaphthalene	20 U	20 U	20 U	20 U
Hexachlorocyclopentadiene	20 U	20 U	20 U	20 U
2,4,6-Trichlorophenol	20 U	20 U	20 U	20 U
2,4,5-Trichlorophenol	20 U	20 U	20 U	20 U
2-Chloronaphthalene	20 U	20 U	20 U	20 U
2-Nitroaniline	20 U	20 U	20 U	20 U
Dimethylphthalate	20 U	20 U	20 U	20 U
Acenaphthylene	20 U	20 U	20 U	20 U
3-Nitroaniline	20 U	20 U	20 U	20 U
Acenaphthene	20 U	20 U	20 U	20 U
2,4-Dinitrophenol	20 U	20 U	20 U	20 U
4-Nitrophenol	20 U	20 U	20 U	20 U
Dibenzofuran	20 U	20 U	20 U	20 U
2,6-Dinitrotoluene	20 U	20 U	20 U	20 U
2,4-Dinitrotoluene	20 U	20 U	20 U	20 U
Diethylphthalate	20 U	20 U	20 U	20 U
4-Chlorophenyl-phenylether	20 U	20 U	20 U	20 U
Fluorene	20 U	20 U	20 U	20 U
4-Nitroaniline	20 U	20 U	20 U	20 U

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Absolute Amount in Injected Volume (ng)			
	9019545	9019546	9019547	9019548
4,6-Dinitro-2-methylphenol	20 U	20 U	20 U	20 U
N-Nitrosodiphenylamine	20 U	20 U	20 U	20 U
1,2-Diphenylhydrazine	20 U	20 U	20 U	20 U
4-Bromophenyl-phenylether	20 U	20 U	20 U	20 U
Pentachlorophenol	20 U	20 U	20 U	20 U
Phenanthrene	20 U	20 U	20 U	20 U
Anthracene	20 U	20 U	20 U	20 U
Di-n-butylphthalate	20 U	20 U	20 U	20 U
Hexachlorobenzene	20 U	20 U	20 U	20 U
Fluoranthene	20 U	20 U	20 U	20 U
Benzidine	NA	NA	NA	NA
Pyrene	20 UJ	20 UJ	20 UJ	20 UJ
Butylbenzylphthalate	20 U	20 U	20 U	20 U
3,3'-Dichlorobenzidine	20 U	20 U	20 U	20 U
Benzo(a)anthracene	20 U	20 U	20 U	20 U
bis(2-Ethylhexyl)phthalate	20 U	20 U	50	20 U
Chrysene	20 U	20 U	20 U	20 U
Di-n-octylphthalate	20 U	20 U	20 U	17 J
Benzo(b)fluoranthene	20 U	20 U	20 U	20 U
Benzo(k)fluoranthene	20 U	20 U	20 U	20 U
Benzo(a)pyrene	20 U	20 U	20 U	20 U
Indeno(1,2,3-cd)pyrene	20 U	20 U	20 U	20 U
Dibenz(a,h)anthracene	20 U	20 U	20 U	20 U
Benzo(g,h,i)perylene	20 U	20 U	20 U	20 U

U - Not detected. Value is the quantitation limit.
UJ - Not detected. Quantitation limit is qualified as an estimate.
J - Detected result is qualified as an estimate.
NA - Not analyzed.

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Absolute Amount in Injected Volume (ng) 9019549
N-Nitrosodimethylamine	20 U
Phenol	20 U
bis(2-Chloroethyl)ether	20 U
2-Chlorophenol	20 U
1,3-Dichlorobenzene	20 U
1,4-Dichlorobenzene	20 U
Benzyl Alcohol	20 UJ
1,2-Dichlorobenzene	20 U
2-Methylphenol	20 U
bis(2-Chloroisopropyl)ether	20 U
4-Methylphenol	20 U
N-Nitroso-di-n-propylamine	20 U
Hexachloroethane	20 U
Nitrobenzene	20 U
Isophorone	20 U
2-Nitrophenol	20 U
2,4-Dimethylphenol	20 U
Benzoic Acid	20 U
bis(2-Chloroethoxy)methane	20 U
2,4-Dichlorophenol	20 U
1,2,4-Trichlorobenzene	20 U
Naphthalene	20 U
4-Chloroaniline	20 U
Hexachlorobutadiene	20 U
4-Chloro-3-methylphenol	20 U
2-Methylnaphthalene	20 U
Hexachlorocyclopentadiene	20 U
2,4,6-Trichlorophenol	20 U
2,4,5-Trichlorophenol	20 U
2-Chloronaphthalene	20 U
2-Nitroaniline	20 U
Dimethylphthalate	20 U
Acenaphthylene	20 U
3-Nitroaniline	20 U
Acenaphthene	20 U
2,4-Dinitrophenol	20 U
4-Nitrophenol	20 U
Dibenzofuran	20 U
2,6-Dinitrotoluene	20 U
2,4-Dinitrotoluene	20 U
Diethylphthalate	20 U
4-Chlorophenyl-phenylether	20 U
Fluorene	20 U
4-Nitroaniline	20 U

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Absolute Amount in Injected Volume (ng) 9019549
4,6-Dinitro-2-methylphenol	20 U
N-Nitrosodiphenylamine	20 U
1,2-Diphenylhydrazine	20 U
4-Bromophenyl-phenylether	20 U
Pentachlorophenol	20 U
Phenanthrene	20 U
Anthracene	20 U
Di-n-butylphthalate	20 U
Hexachlorobenzene	20 U
Fluoranthene	20 U
Benzidine	NA
Pyrene	20 UJ
Butylbenzylphthalate	20 U
3,3'-Dichlorobenzidine	20 U
Benzo(a)anthracene	20 U
bis(2-Ethylhexyl)phthalate	20 U
Chrysene	20 U
Di-n-octylphthalate	20 U
Benzo(b)fluoranthene	20 U
Benzo(k)fluoranthene	20 U
Benzo(a)pyrene	20 U
Indeno(1,2,3-cd)pyrene	20 U
Dibenz(a,h)anthracene	20 U
Benzo(g,h,i)perylene	20 U

U - Not detected. Value is the quantitation limit.
UJ - Not detected. Quantitation limit is qualified as an estimate.
J - Detected result is qualified as an estimate.
NA - Not analyzed.

8-24-91

Environmental Service Assistance Team -- Zone II

ICF Technology, Inc.

ManTech Environmental

ESAT Region X
ICF Technology, Inc.
1200 6th Avenue
Seattle, WA 98101
(206) 553-6690

MEMORANDUM

DATE: August 18, 1992

TO: Donald Matheny, USEPA Task Monitor
Jerry Muth, USEPA DPO

FROM: Gerald H. Dodo, ESAT Data Reviewer

THROUGH: Barry Pepich, ETM

SUBJECT: Data Validation Report of Volatile Organic Analyses of Samples from the Yakima Agricultural Research Laboratory

TID NO. 10-9203-045

DOCUMENT NO: ESAT-10-B-6144

The quality assurance (QA) review of 7 water and 31 soil samples collected from the above referenced site has been completed. These samples were analyzed for volatile organic target analytes by SW-846 Method 8240 "Gas Chromatographic/Mass Spectrometry for Volatile Organics", 3rd edition, 9/86. The laboratory that performed the analyses was Biospherics, Inc., Beltsville, Maryland. The following samples were analyzed:

Waters

90042T91	90042T92	90042T95	T12-2	T19-3	T19-4
T19-5					

Soils

90042TPS1	90042TPS2	90042TPS3	90042TPS4	90042TPS5	90042TPS6
90042TPS7	90042TPS8	90042WPS1	90042WPS2	90042WPS3	90042WPS4
BGS-1	BGS-2	BGS-3	BGS-4	DF-90-1	DF-90-2
DF-90-3	DF-90-4	DF-90-5	DF-90-6	DF-90-7	TR102
TR103	TR104	TR105	TR106	WP101	WP102
TP101					

DATA QUALIFICATIONS

The following comments refer to the laboratory performance in meeting the Quality Control Specifications outlined in Method 8240 and the

"Functional Guidelines for Evaluating Organics Analyses, revision 2/88".

The conclusions presented herein are based on the information provided for the review. Information not made available for this review are pointed out in each section affected. All sample analysis results were submitted only in the form of raw data.

1. Timeliness

The Chain-of-Custody forms (COCs) provided with the data did not indicate that the samples were preserved. For many samples, either an associated COC was not provided or the actual sampling and laboratory receipt date was not documented on the COC.

Listed below are pertinent sampling, laboratory receipt and analysis dates.

Sample Number	Matrix	Sample Date	Rec'd. Date	Analysis Date
90042T95	Water	NA	061390	061490
90042T92	Water	NA	061390	061490
90042TPS1	Soil	NA	061390	061390
90042TPS2	Soil	NA	061390	061390
90042TPS3	Soil	NA	061390	061390
90042TPS4	Soil	NA	061390	061390
90042TPS5	Soil	NA	061390	061390
90042TPS6	Soil	NA	061390	061390
90042TPS7	Soil	NA	061390	061390
90042TPS8	Soil	NA	061390	061390
90042WPS1	Soil	NA	061390	061390
90042WPS2	Soil	NA	061390	061390
90042WPS3	Soil	NA	061390	061390
90042WPS4	Soil	NA	061390	061390
90042T91	Water	NA	061390	061390
T12-2	Water	061990	062290	062590
BGS-1	Soil	061990	NA	062590
BGS-2	Soil	061990	NA	062590
BGS-3	Soil	061990	NA	062590
BGS-4	Soil	061990	NA	062590
DF-90-1	Soil	061990	062290	062590
DF-90-2	Soil	061990	062290	062590
DF-90-3	Soil	061990	062290	062590
DF-90-4	Soil	061990	062290	062590
DF-90-5	Soil	061990	062290	062590
DF-90-6	Soil	061990	062290	062590
DF-90-7	Soil	061990	062290	062690
TR102	Soil	NA	NA	102690
TR104	Soil	NA	NA	102690
TR105	Soil	NA	NA	102690
TR106	Soil	NA	NA	102690
WP101	Soil	NA	102490	102690
WP102	Soil	NA	102490	102690
T19-3	Water	NA	102490	102690
T19-4	Water	NA	102490	102690

(continued)

Sample Number	Matrix	Sample Date	Rec'd. Date	Analysis Date
T19-5	Water	NA	102490	102690
TR103	Soil	NA	NA	102690
TP101	Soil	102390	102490	102990

NA - Information not available.

Where information was provided, the 7 day technical holding time for non-preserved water samples was met. Soil samples with sampling dates provided were analyzed within 7 days from time of sampling.

No qualifiers were applied to the data based on holding times.

2. GC/MS Tuning - Acceptable

A GC/MS Tuning Check was performed at the beginning of each 12 hour period of sample analyses meeting the criteria for frequency. The provided summary for each tuning performance determined that the tuning criteria were met. However, tabulated mass data were not available to fully verify the calculated results reported on the summaries.

3. Initial Calibration

Initial calibrations were performed on 06/06/90 and 10/25/90. Standards of 20, 50, 100, 150, and 200 ppb (6 times higher for acrolein and acrylonitrile) were analyzed. This resulted in quantitation limits (QL) of 20 ppb for all analytes except for acrolein and acrylonitrile at 120 ppb. The minimum average relative response factor (RRF) requirement of 0.05 specified in the Functional Guidelines for all target compounds was met except for acrolein for the 10/25/90 initial calibration which resulted with 0.01048 average RRF. All acrolein results associated with the 10/25/90 initial calibration are qualified as estimates, **"J/UJ"**. The following sample results for acrolein were qualified:

TR102	TR104	TR105	TR106	WP101	WP102
T19-3	T19-4	T19-5	TR103	TR101	

The percent relative standard deviations (% RSDs) of the RRFs for all compounds met the criterion of less than 30% RSD.

The reported RRF values were verified from the raw data. Calculations were correct and no transcription errors were determined.

4. Continuing Calibration

A continuing calibration standard analysis (CCS) was performed for each 12 hour period of sample analyses which meets the criterion for frequency. All necessary raw data were provided except for the 102690

CCS. Findings for this CCS are based only on the RRF summary table submitted.

RRF percent differences (%Ds) from the average initial RRFs met the criteria for all target compounds (less than or equal to 25%) except for the following:

Calibration Date	Analytes >25%D	%D
061490	2-Butanone	28
	2-Chloroethylvinylether	38
062590	2-Chloroethylvinylether	35
062690	Chloromethane	27
	Trichlorofluoromethane	-49
	1,2-Dichloroethane	-39
	1,1,1-Trichloroethane	-42
	Carbon Tetrachloride	-36
	2-Chloroethylvinylether	35
102690	Acrolein	-61
102990	Acrolein	-45

The associated samples and analyte results were qualified as estimates, **"J,UJ"**. Non-detected sample results for analytes associated with a CCS with %Ds out of criteria but indicate an increase in sensitivity ("-" %D) were not qualified.

The reported RRF values were verified from the raw data. The minimum RRF criterion (0.05) was met for all analytes except for acrolein for CCSs on 10/26/90 and 10/29/90. Since the data were previously qualified based on the initial calibration performance, no further qualifications were applied.

Calculations were correct and no transcription errors were determined.

5. Blanks - Acceptable

The frequency of method blank analyses were met. Background levels for all target analytes in the method blanks were below the QLs. Toluene was detected in the 10/29/90 method blank at slightly less than 1 ppb however, all associated detected sample results were >5 times this concentration.

6. Surrogate Recovery - Acceptable

All surrogate recoveries for each sample analysis were within the method criteria for each surrogate and matrix. The spike level for each surrogate was assumed to be at 50 ppb. Recoveries ranged from 84-120%.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) - Acceptable

Samples 90042T91, TPS-1, BGS-1, WP102, and T19-5 were used for MS/MSD analyses. The frequency of analyses for the MS/MSDs was met. All recoveries were within the criteria described in the Functional Guidelines. The recoveries ranged from 84-119% for all spiked compounds. The relative percent difference (RPD) between the spiked compounds ranged from 0-9.5% RPD.

8. Laboratory Control Sample - Not Applicable

Based on the information provided, a laboratory control sample (LCS) was not analyzed.

9. Internal Standards Performance

The data reported on the Internal Standard Area Summary (Form VIII) were verified with the raw data. Chromatograms and transcriptions were examined. The internal standard (IS) area counts and the retention time shifts for all sample analyses were acceptable except for the following samples which resulted in area counts <50% of the associated CCS:

Sample	IS <50%
90042TPS1	All
90042TPS3	1,4-Difluorobenzene, Chlorobenzene-d5
90042TPS6	All
BGS-3	Chlorobenzene-d5
DF-90-1	All
DF-90-2	All
DF-90-3	All
DF-90-5	1,4-Difluorobenzene, Chlorobenzene-d5
DF-90-6	All
DF-90-7	All

Associated sample results for the above ISs were qualified as estimates, **"J/UJ"**. No raw data were submitted for the CCS on 10/26/90 therefore, no IS evaluation could be performed.

10. Compound Identification

No spectra were submitted with the raw data, therefore, the spectral matching criteria could not be applied. The detected sample results were not qualified based on the lack of spectral information.

All detected sample results were within relative retention time (RRT) windows established by the associated CCS.

11. Compound Quantitation and Detection Limits

The method describes practical quantitation limits of 5-10 ppb for the analytes (50-100 ppb for water soluble analytes) for both water and soil matrices. The sample analyses were performed at QLs much higher than that described in the method.

The raw data was verified with the reported results. Calculations were correct. All samples and blanks' results were quantitated against an updated daily calibration standard. Analytes detected below the QL were qualified as estimates, "J", by the reviewer.

12. Tentatively Identified Compounds - Not Applicable

No raw data associated with Tentatively Identified Compound (TIC) analysis were submitted. It does not appear that the laboratory had performed any TIC analyses.

13. System Performance

Based on the chromatograms for the 20ppb initial calibration standard analyses, the laboratory could have achieved much lower QLs.

14. Laboratory Contact

The laboratory was not contacted for this review.

15. Data Use - Acceptable

The data, as qualified, is acceptable for use.

DATA QUALIFIER DEFINITIONS

U- The analyte was analyzed for and is not present above the level of the associated value. The associated numerical value indicates the approximate concentration necessary to detect the analyte in this sample.

If a decision requires quantitation of the analyte below the associated numerical level, reanalysis or alternative analytical methods should be considered. The technical staff is available to discuss available options.

J- The analyte was analyzed for and was positively identified, but the associated numerical value may not be consistent with the amount actually present in the environmental sample. The data should be seriously considered for decision making and are usable for many purposes.

A subscript may be appended to the "J" that indicates which of the following quality control criteria were not met:

1 Blank contamination: indicates possible high bias and/or false positives.

2 Calibration range exceeded: indicates possible low bias.

3 Holding times not met: indicates low bias for most analytes with the exception of common laboratory contaminants and chlorinated ethenes (i.e.: trichloroethene, 1,1-dichloroethene, vinyl chloride).

4 Other QC outside control limits: bias not readily determined.

R- The data are unusable for all purposes. The analyte was analyzed for, but the presence or absence of the analyte has not been verified.

Resampling and reanalysis are necessary to confirm or deny the presence of the analyte.

UJ - A combination of the "U" and "J" qualifier. The analyte was analyzed for and was not present above the level of the associated value. The associated numerical value may not accurately or precisely represent the concentration necessary to detect the analyte in this sample.

If a decision requires quantitation of the analyte close to the associated numerical level, reanalysis or alternative analytical methods should be considered.

N- The analysis indicates that an analyte is present, and there are strong indications that the identity is correct.

Confirmation of the analyte requires further analysis.

NJ- A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

A subscript may be appended to the "NJ" that indicates which of the following situations applies:

1 DDT/Endrin breakdown evident.

2 Interference from other sample components.

3 Non-Target Compound List (TCL) compounds (Confirmation is necessary using specific target compound methodology to accurately determine the concentration and identity of the detected compound).

4 A confirmation analysis was missing or quality control criteria were not met for the confirmation analysis.

NOTE: Data users are encouraged to contact their Regional representative within ESD to clarify or obtain further information on the appropriate use of analytical data.

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Concentration (ppb) 90042T95	90042T92	90042TPS1	90042TPS2
Chloromethane	20 U	100 U	20 UJ	20 U
Bromomethane	20 U	100 U	20 UJ	20 U
Vinyl Chloride	20 U	100 U	20 UJ	20 U
Chloroethane	20 U	100 U	20 UJ	20 U
Methylene Chloride	20 U	100 U	20 UJ	20 U
Acetone	20 U	100 U	20 UJ	20 U
Carbon Disulfide	20 U	100 U	20 UJ	20 U
Acrolein	120 U	600 U	120 UJ	120 U
Acrylonitrile	120 U	600 U	120 UJ	120 U
Trichlorofluoromethane	20 U	100 U	20 UJ	20 U
1,1-Dichloroethene	20 U	100 U	20 UJ	20 U
1,1-Dichloroethane	20 U	100 U	20 UJ	20 U
trans-1,2-Dichloroethene	20 U	100 U	20 UJ	20 U
Chloroform	20 U	100 U	20 UJ	20 U
1,2-Dichloroethane	20 U	100 U	20 UJ	20 U
2-Butanone	20 UJ	100 UJ	20 UJ	20 U
1,1,1-Trichloroethane	20 U	100 U	20 UJ	20 U
Carbon Tetrachloride	20 U	100 U	20 UJ	20 U
Vinyl Acetate	20 U	100 U	20 UJ	20 U
Bromodichloromethane	20 U	100 U	20 UJ	20 U
1,2-Dichloropropane	20 U	100 U	20 UJ	20 U
trans-1,3-Dichloropropene	20 U	100 U	20 UJ	20 U
Trichloroethene	20 U	100 U	20 UJ	20 U
Dibromochloromethane	20 U	100 U	20 UJ	20 U
1,1,2-Trichloroethane	20 U	100 U	20 UJ	20 U
Benzene	20 U	100 U	20 UJ	20 U
cis-1,3-Dichloropropene	20 U	100 U	20 UJ	20 U
2-Chloroethylvinylether	20 UJ	100 UJ	20 UJ	20 U
Bromoform	20 U	100 U	20 UJ	20 U
2-Hexanone	20 U	100 U	20 UJ	20 U
4-Methyl-2-Pentanone	20 U	100 U	20 UJ	20 U
Tetrachloroethene	20 U	100 U	20 UJ	20 U
1,1,2,2-Tetrachloroethane	20 U	100 U	20 UJ	20 U
Toluene	20 U	100 U	20 UJ	20 U
Chlorobenzene	20 U	100 U	20 UJ	20 U
Ethylbenzene	20 U	100 U	20 UJ	20 U
Styrene	20 U	100 U	20 UJ	20 U
Total Xylenes	20 U	100 U	20 UJ	20 U

U - Not detected. Value is the quantitation limit.
UJ - Not detected. Quantitation limit is qualified as an estimate.
J - Detected result is qualified as an estimate.

8-19-96

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Concentration (ppb) 90042TPS3	90042TPS4	90042TPS5	90042TPS6
Chloromethane	20 U	20 U	20 U	20 UJ
Bromomethane	20 U	20 U	20 U	20 UJ
Vinyl Chloride	20 U	20 U	20 U	20 UJ
Chloroethane	20 U	20 U	20 U	20 UJ
Methylene Chloride	20 U	20 U	20 U	20 UJ
Acetone	20 U	20 U	20 U	20 UJ
Carbon Disulfide	20 U	20 U	20 U	20 UJ
Acrolein	120 U	120 U	120 U	120 UJ
Acrylonitrile	120 U	120 U	120 U	120 UJ
Trichlorofluoromethane	20 U	20 U	20 U	20 UJ
1,1-Dichloroethene	20 U	20 U	20 U	20 UJ
1,1-Dichloroethane	20 U	20 U	20 U	20 UJ
trans-1,2-Dichloroethene	20 U	20 U	20 U	20 UJ
Chloroform	20 U	20 U	20 U	20 UJ
1,2-Dichloroethane	20 U	20 U	20 U	20 UJ
2-Butanone	20 UJ	20 U	20 U	20 UJ
1,1,1-Trichloroethane	20 UJ	20 U	20 U	20 UJ
Carbon Tetrachloride	20 UJ	20 U	20 U	20 UJ
Vinyl Acetate	20 UJ	20 U	20 U	20 UJ
Bromodichloromethane	20 UJ	20 U	20 U	20 UJ
1,2-Dichloropropane	20 UJ	20 U	20 U	20 UJ
trans-1,3-Dichloropropene	20 UJ	20 U	20 U	20 UJ
Trichloroethene	20 UJ	20 U	20 U	20 UJ
Dibromochloromethane	20 UJ	20 U	20 U	20 UJ
1,1,2-Trichloroethane	20 UJ	20 U	20 U	20 UJ
Benzene	20 UJ	20 U	20 U	20 UJ
cis-1,3-Dichloropropene	20 UJ	20 U	20 U	20 UJ
2-Chloroethylvinylether	20 UJ	20 U	20 U	20 UJ
Bromoform	20 UJ	20 U	20 U	20 UJ
2-Hexanone	20 UJ	20 U	20 U	20 UJ
4-Methyl-2-Pentanone	20 UJ	20 U	20 U	20 UJ
Tetrachloroethene	20 UJ	20 U	20 U	20 UJ
1,1,2,2-Tetrachloroethane	20 UJ	20 U	20 U	20 UJ
Toluene	20 UJ	20 U	20 U	20 UJ
Chlorobenzene	20 UJ	20 U	20 U	20 UJ
Ethylbenzene	20 UJ	20 U	20 U	20 UJ
Styrene	20 UJ	20 U	20 U	20 UJ
Total Xylenes	20 UJ	20 U	20 U	20 UJ

U - Not detected. Value is the quantitation limit.
UJ - Not detected. Quantitation limit is qualified as an estimate.
J - Detected result is qualified as an estimate.

8-19-92

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Concentration (ppb) 90042TPS7	90042TPS8	90042WPS1	90042WPS2
Chloromethane	20 U	20 U	20 U	20 U
Bromomethane	20 U	20 U	20 U	20 U
Vinyl Chloride	20 U	20 U	20 U	20 U
Chloroethane	20 U	20 U	20 U	20 U
Methylene Chloride	20 U	20 U	20 U	20 U
Acetone	20 U	20 U	20 U	20 U
Carbon Disulfide	20 U	20 U	20 U	20 U
Acrolein	120 U	120 U	120 U	120 U
Acrylonitrile	120 U	120 U	120 U	120 U
Trichlorofluoromethane	20 U	20 U	20 U	20 U
1,1-Dichloroethene	20 U	20 U	20 U	20 U
1,1-Dichloroethane	20 U	20 U	20 U	20 U
trans-1,2-Dichloroethene	20 U	20 U	20 U	20 U
Chloroform	20 U	20 U	20 U	20 U
1,2-Dichloroethane	20 U	20 U	20 U	20 U
2-Butanone	20 U	20 U	20 U	20 U
1,1,1-Trichloroethane	20 U	20 U	20 U	20 U
Carbon Tetrachloride	20 U	20 U	20 U	20 U
Vinyl Acetate	20 U	20 U	20 U	20 U
Bromodichloromethane	20 U	20 U	20 U	20 U
1,2-Dichloropropane	20 U	20 U	20 U	20 U
trans-1,3-Dichloropropene	20 U	20 U	20 U	20 U
Trichloroethene	20 U	20 U	20 U	20 U
Dibromochloromethane	20 U	20 U	20 U	20 U
1,1,2-Trichloroethane	20 U	20 U	20 U	20 U
Benzene	20 U	20 U	20 U	20 U
cis-1,3-Dichloropropene	20 U	20 U	20 U	20 U
2-Chloroethylvinylether	20 U	20 U	20 U	20 U
Bromoform	20 U	20 U	20 U	20 U
2-Hexanone	20 U	20 U	20 U	20 U
4-Methyl-2-Pentanone	20 U	20 U	20 U	20 U
Tetrachloroethene	20 U	20 U	20 U	20 U
1,1,2,2-Tetrachloroethane	20 U	20 U	20 U	20 U
Toluene	20 U	20 U	20 U	20 U
Chlorobenzene	20 U	20 U	20 U	20 U
Ethylbenzene	20 U	20 U	20 U	20 U
Styrene	20 U	20 U	20 U	20 U
Total Xylenes	20 U	20 U	20 U	20 U

U - Not detected. Value is the quantitation limit.
UJ - Not detected. Quantitation limit is qualified as an estimate.
J - Detected result is qualified as an estimate.

8-19-92

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Concentration (ppb) 90042WPS3	90042WPS4	90042T91	T12-2
Chloromethane	20 U	20 U	20 U	100 U
Bromomethane	20 U	20 U	20 U	100 U
Vinyl Chloride	20 U	20 U	20 U	100 U
Chloroethane	20 U	20 U	20 U	100 U
Methylene Chloride	20 U	20 U	20 U	100 U
Acetone	20 U	20 U	20 U	100 U
Carbon Disulfide	20 U	20 U	20 U	100 U
Acrolein	120 U	120 U	120 U	600 U
Acrylonitrile	120 U	120 U	120 U	600 U
Trichlorofluoromethane	20 U	20 U	20 U	100 U
1,1-Dichloroethene	20 U	20 U	20 U	100 U
1,1-Dichloroethane	20 U	20 U	20 U	100 U
trans-1,2-Dichloroethene	20 U	20 U	20 U	100 U
Chloroform	20 U	20 U	20 U	100 U
1,2-Dichloroethane	20 U	20 U	20 U	100 U
2-Butanone	20 U	20 U	20 U	100 U
1,1,1-Trichloroethane	20 U	20 U	20 U	100 U
Carbon Tetrachloride	20 U	20 U	20 U	100 U
Vinyl Acetate	20 U	20 U	20 U	100 U
Bromodichloromethane	20 U	20 U	20 U	100 U
1,2-Dichloropropane	20 U	20 U	20 U	100 U
trans-1,3-Dichloropropene	20 U	20 U	20 U	100 U
Trichloroethene	20 U	20 U	20 U	100 U
Dibromochloromethane	20 U	20 U	20 U	100 U
1,1,2-Trichloroethane	20 U	20 U	20 U	100 U
Benzene	20 U	20 U	20 U	100 U
cis-1,3-Dichloropropene	20 U	20 U	20 U	100 U
2-Chloroethylvinylether	20 U	20 U	20 U	100 UJ
Bromoform	20 U	20 U	20 U	100 U
2-Hexanone	20 U	20 U	20 U	100 U
4-Methyl-2-Pentanone	20 U	20 U	20 U	100 U
Tetrachloroethene	20 U	20 U	20 U	100 U
1,1,2,2-Tetrachloroethane	20 U	20 U	20 U	100 U
Toluene	20 U	20 U	20 U	100 U
Chlorobenzene	20 U	20 U	20 U	100 U
Ethylbenzene	20 U	20 U	20 U	100 U
Styrene	20 U	20 U	20 U	100 U
Total Xylenes	20 U	20 U	20 U	100 U

U - Not detected. Value is the quantitation limit.
UJ - Not detected. Quantitation limit is qualified as an estimate.
J - Detected result is qualified as an estimate.

8-19-92

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Concentration (ppb) BGS-1	BGS-2	BGS-3	BGS-4
Chloromethane	20 U	20 U	20 U	20 U
Bromomethane	20 U	20 U	20 U	20 U
Vinyl Chloride	20 U	20 U	20 U	20 U
Chloroethane	20 U	20 U	20 U	20 U
Methylene Chloride	20 U	20 U	20 U	20 U
Acetone	20 U	20 U	20 U	20 U
Carbon Disulfide	20 U	20 U	20 U	20 U
Acrolein	120 U	120 U	120 U	120 U
Acrylonitrile	120 U	120 U	120 U	120 U
Trichlorofluoromethane	20 U	20 U	20 U	20 U
1,1-Dichloroethene	20 U	20 U	20 U	20 U
1,1-Dichloroethane	20 U	20 U	20 U	20 U
trans-1,2-Dichloroethene	20 U	20 U	20 U	20 U
Chloroform	20 U	20 U	20 U	20 U
1,2-Dichloroethane	20 U	20 U	20 U	20 U
2-Butanone	20 U	20 U	20 U	20 U
1,1,1-Trichloroethane	20 U	20 U	20 U	20 U
Carbon Tetrachloride	20 U	20 U	20 U	20 U
Vinyl Acetate	20 U	20 U	20 U	20 U
Bromodichloromethane	20 U	20 U	20 U	20 U
1,2-Dichloropropane	20 U	20 U	20 U	20 U
trans-1,3-Dichloropropene	20 U	20 U	20 U	20 U
Trichloroethene	20 U	20 U	20 U	20 U
Dibromochloromethane	20 U	20 U	20 U	20 U
1,1,2-Trichloroethane	20 U	20 U	20 U	20 U
Benzene	20 U	20 U	20 U	20 U
cis-1,3-Dichloropropene	20 U	20 U	20 U	20 U
2-Chloroethylvinylether	20 UJ	20 UJ	20 UJ	20 UJ
Bromoform	20 U	20 U	20 U	20 U
2-Hexanone	20 U	20 U	20 UJ	20 U
4-Methyl-2-Pentanone	20 U	20 U	20 UJ	20 U
Tetrachloroethene	20 U	20 U	20 UJ	20 U
1,1,2,2-Tetrachloroethane	20 U	20 U	20 UJ	20 U
Toluene	20 U	13 J	89 J	123
Chlorobenzene	20 U	20 U	20 UJ	20 U
Ethylbenzene	20 U	20 U	20 UJ	20 U
Styrene	20 U	20 U	20 UJ	20 U
Total Xylenes	20 U	20 U	20 UJ	20 U

U - Not detected. Value is the quantitation limit.
UJ - Not detected. Quantitation limit is qualified as an estimate.
J - Detected result is qualified as an estimate.

8-19-92

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Concentration (ppb) DF-90-1	DF-90-2	DF-90-3	DF-90-4
Chloromethane	20 UJ	20 UJ	20 UJ	20 U
Bromomethane	20 UJ	20 UJ	20 UJ	20 U
Vinyl Chloride	20 UJ	20 UJ	20 UJ	20 U
Chloroethane	20 UJ	20 UJ	20 UJ	20 U
Methylene Chloride	20 UJ	20 UJ	20 UJ	20 U
Acetone	20 UJ	20 UJ	20 UJ	20 U
Carbon Disulfide	20 UJ	20 UJ	20 UJ	20 U
Acrolein	120 UJ	120 UJ	120 UJ	120 U
Acrylonitrile	120 UJ	120 UJ	120 UJ	120 U
Trichlorofluoromethane	20 UJ	20 UJ	20 UJ	20 U
1,1-Dichloroethene	20 UJ	20 UJ	20 UJ	20 U
1,1-Dichloroethane	20 UJ	20 UJ	20 UJ	20 U
trans-1,2-Dichloroethene	20 UJ	20 UJ	20 UJ	20 U
Chloroform	20 UJ	20 UJ	20 UJ	20 U
1,2-Dichloroethane	20 UJ	20 UJ	20 UJ	20 U
2-Butanone	20 UJ	20 UJ	20 UJ	20 U
1,1,1-Trichloroethane	20 UJ	20 UJ	20 UJ	20 U
Carbon Tetrachloride	20 UJ	20 UJ	20 UJ	20 U
Vinyl Acetate	20 UJ	20 UJ	20 UJ	20 U
Bromodichloromethane	20 UJ	20 UJ	20 UJ	20 U
1,2-Dichloropropane	20 UJ	20 UJ	20 UJ	20 U
trans-1,3-Dichloropropene	20 UJ	20 UJ	20 UJ	20 U
Trichloroethene	20 UJ	20 UJ	20 UJ	20 U
Dibromochloromethane	20 UJ	20 UJ	20 UJ	20 U
1,1,2-Trichloroethane	20 UJ	20 UJ	20 UJ	20 U
Benzene	20 UJ	20 UJ	20 UJ	20 U
cis-1,3-Dichloropropene	20 UJ	20 UJ	20 UJ	20 U
2-Chloroethylvinylether	20 UJ	20 UJ	20 UJ	20 UJ
Bromoform	20 UJ	20 UJ	20 UJ	20 U
2-Hexanone	20 UJ	20 UJ	20 UJ	20 U
4-Methyl-2-Pentanone	20 UJ	20 UJ	20 UJ	20 U
Tetrachloroethene	20 UJ	20 UJ	20 UJ	20 U
1,1,2,2-Tetrachloroethane	20 UJ	20 UJ	20 UJ	20 U
Toluene	210 J	52 J	110 J	57
Chlorobenzene	20 UJ	20 UJ	20 UJ	20 U
Ethylbenzene	20 UJ	20 UJ	20 UJ	20 U
Styrene	20 UJ	20 UJ	20 UJ	20 U
Total Xylenes	20 UJ	20 UJ	20 UJ	20 U

U - Not detected. Value is the quantitation limit.
UJ - Not detected. Quantitation limit is qualified as an estimate.
J - Detected result is qualified as an estimate.

8-19-92

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Concentration (ppb) DF-90-5	DF-90-6	DF-90-7	TR102
Chloromethane	20 U	20 UJ	20 UJ	20 U
Bromomethane	20 U	20 UJ	20 UJ	20 U
Vinyl Chloride	20 U	20 UJ	20 UJ	20 U
Chloroethane	20 U	20 UJ	20 UJ	20 U
Methylene Chloride	20 U	20 UJ	20 UJ	20 U
Acetone	20 U	20 UJ	20 UJ	20 U
Carbon Disulfide	20 U	20 UJ	20 UJ	20 U
Acrolein	120 U	120 UJ	120 UJ	120 UJ
Acrylonitrile	120 U	120 UJ	120 UJ	120 U
Trichlorofluoromethane	20 U	20 UJ	20 UJ	20 U
1,1-Dichloroethene	20 U	20 UJ	20 UJ	20 U
1,1-Dichloroethane	20 U	20 UJ	20 UJ	20 U
trans-1,2-Dichloroethene	20 U	20 UJ	20 UJ	20 U
Chloroform	20 U	20 UJ	20 UJ	20 U
1,2-Dichloroethane	20 U	20 UJ	20 UJ	20 U
2-Butanone	20 UJ	20 UJ	20 UJ	20 U
1,1,1-Trichloroethane	20 UJ	20 UJ	20 UJ	20 U
Carbon Tetrachloride	20 UJ	20 UJ	20 UJ	20 U
Vinyl Acetate	20 UJ	20 UJ	20 UJ	20 U
Bromodichloromethane	20 UJ	20 UJ	20 UJ	20 U
1,2-Dichloropropane	20 UJ	20 UJ	20 UJ	20 U
trans-1,3-Dichloropropene	20 UJ	20 UJ	20 UJ	20 U
Trichloroethene	20 UJ	20 UJ	20 UJ	20 U
Dibromochloromethane	20 UJ	20 UJ	20 UJ	20 U
1,1,2-Trichloroethane	20 UJ	20 UJ	20 UJ	20 U
Benzene	20 UJ	20 UJ	20 UJ	20 U
cis-1,3-Dichloropropene	20 UJ	20 UJ	20 UJ	20 U
2-Chloroethylvinylether	20 UJ	20 UJ	20 UJ	20 U
Bromoform	20 UJ	20 UJ	20 UJ	20 U
2-Hexanone	20 UJ	20 UJ	20 UJ	20 U
4-Methyl-2-Pentanone	20 UJ	20 UJ	20 UJ	20 U
Tetrachloroethene	20 UJ	20 UJ	20 UJ	20 U
1,1,2,2-Tetrachloroethane	20 UJ	20 UJ	20 UJ	20 U
Toluene	190 J	140 J	100 J	20 U
Chlorobenzene	20 UJ	20 UJ	20 UJ	20 U
Ethylbenzene	20 UJ	20 UJ	20 UJ	20 U
Styrene	20 UJ	20 UJ	20 UJ	20 U
Total Xylenes	20 UJ	20 UJ	20 UJ	20 U

U - Not detected. Value is the quantitation limit.
UJ - Not detected. Quantitation limit is qualified as an estimate.
J - Detected result is qualified as an estimate.

1000
8-19-92

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Concentration (ppb) TR104	TR105	TR106	WP101
Chloromethane	20 U	20 U	20 U	20 U
Bromomethane	20 U	20 U	20 U	20 U
Vinyl Chloride	20 U	20 U	20 U	20 U
Chloroethane	20 U	20 U	20 U	20 U
Methylene Chloride	20 U	20 U	20 U	20 U
Acetone	20 U	20 U	20 U	20 U
Carbon Disulfide	20 U	20 U	20 U	20 U
Acrolein	120 UJ	120 UJ	120 UJ	120 UJ
Acrylonitrile	120 U	120 U	120 U	120 U
Trichlorofluoromethane	20 U	20 U	20 U	20 U
1,1-Dichloroethene	20 U	20 U	20 U	20 U
1,1-Dichloroethane	20 U	20 U	20 U	20 U
trans-1,2-Dichloroethene	20 U	20 U	20 U	20 U
Chloroform	20 U	20 U	20 U	20 U
1,2-Dichloroethane	20 U	20 U	20 U	20 U
2-Butanone	20 U	20 U	20 U	20 U
1,1,1-Trichloroethane	20 U	20 U	20 U	20 U
Carbon Tetrachloride	20 U	20 U	20 U	20 U
Vinyl Acetate	20 U	20 U	20 U	20 U
Bromodichloromethane	20 U	20 U	20 U	20 U
1,2-Dichloropropane	20 U	20 U	20 U	20 U
trans-1,3-Dichloropropene	20 U	20 U	20 U	20 U
Trichloroethene	20 U	20 U	20 U	20 U
Dibromochloromethane	20 U	20 U	20 U	20 U
1,1,2-Trichloroethane	20 U	20 U	20 U	20 U
Benzene	20 U	20 U	20 U	20 U
cis-1,3-Dichloropropene	20 U	20 U	20 U	20 U
2-Chloroethylvinylether	20 U	20 U	20 U	20 U
Bromoform	20 U	20 U	20 U	20 U
2-Hexanone	20 U	20 U	20 U	20 U
4-Methyl-2-Pentanone	20 U	20 U	20 U	20 U
Tetrachloroethene	20 U	20 U	20 U	20 U
1,1,2,2-Tetrachloroethane	20 U	20 U	20 U	20 U
Toluene	20 U	20 U	20 U	20 U
Chlorobenzene	20 U	20 U	20 U	20 U
Ethylbenzene	20 U	20 U	20 U	20 U
Styrene	20 U	20 U	20 U	20 U
Total Xylenes	20 U	20 U	20 U	20 U

U - Not detected. Value is the quantitation limit.
UJ - Not detected. Quantitation limit is qualified as an estimate.
J - Detected result is qualified as an estimate.

8-19-92

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Concentration (ppb) WP102	T19-3	T19-4	T19-5
Chloromethane	20 U	20 U	20 U	20 U
Bromomethane	20 U	20 U	20 U	20 U
Vinyl Chloride	20 U	20 U	20 U	20 U
Chloroethane	20 U	20 U	20 U	20 U
Methylene Chloride	20 U	20 U	20 U	20 U
Acetone	20 U	20 U	20 U	20 U
Carbon Disulfide	20 U	20 U	20 U	20 U
Acrolein	120 UJ	120 UJ	120 UJ	120 UJ
Acrylonitrile	120 U	120 U	120 U	120 U
Trichlorofluoromethane	20 U	20 U	3 J	20 U
1,1-Dichloroethene	20 U	20 U	20 U	20 U
1,1-Dichloroethane	20 U	20 U	20 U	20 U
trans-1,2-Dichloroethene	20 U	20 U	20 U	20 U
Chloroform	20 U	2 J	4 J	20 U
1,2-Dichloroethane	20 U	20 U	20 U	20 U
2-Butanone	20 U	20 U	20 U	20 U
1,1,1-Trichloroethane	20 U	20 U	20 U	20 U
Carbon Tetrachloride	20 U	20 U	20 U	20 U
Vinyl Acetate	20 U	20 U	20 U	20 U
Bromodichloromethane	20 U	20 U	20 U	20 U
1,2-Dichloropropane	20 U	20 U	20 U	20 U
trans-1,3-Dichloropropene	20 U	20 U	20 U	20 U
Trichloroethene	20 U	20 U	20 U	20 U
Dibromochloromethane	20 U	20 U	20 U	20 U
1,1,2-Trichloroethane	20 U	20 U	20 U	20 U
Benzene	20 U	20 U	20 U	20 U
cis-1,3-Dichloropropene	20 U	20 U	20 U	20 U
2-Chloroethylvinylether	20 U	20 U	20 U	20 U
Bromoform	20 U	20 U	20 U	20 U
2-Hexanone	20 U	20 U	20 U	20 U
4-Methyl-2-Pentanone	20 U	20 U	20 U	20 U
Tetrachloroethene	20 U	20 U	20 U	20 U
1,1,2,2-Tetrachloroethane	20 U	20 U	5 J	20 U
Toluene	20 U	20 U	20 U	20 U
Chlorobenzene	20 U	20 U	20 U	20 U
Ethylbenzene	20 U	20 U	20 U	20 U
Styrene	20 U	20 U	20 U	20 U
Total Xylenes	20 U	20 U	20 U	20 U

U - Not detected. Value is the quantitation limit.
UJ - Not detected. Quantitation limit is qualified as an estimate.
J - Detected result is qualified as an estimate.

4-19-91

SITE: Yakima Agricultural Research Laboratory
WORK UNIT DESCRIPTION: 2162

Compound	Concentration (ppb) TR103	TR101
Chloromethane	20 U	20 U
Bromomethane	20 U	20 U
Vinyl Chloride	20 U	20 U
Chloroethane	20 U	20 U
Methylene Chloride	20 U	20 U
Acetone	20 U	20 U
Carbon Disulfide	20 U	20 U
Acrolein	120 UJ	120 UJ
Acrylonitrile	120 U	120 U
Trichlorofluoromethane	20 U	20 U
1,1-Dichloroethene	20 U	20 U
1,1-Dichloroethane	20 U	20 U
trans-1,2-Dichloroethene	20 U	20 U
Chloroform	20 U	20 U
1,2-Dichloroethane	20 U	20 U
2-Butanone	20 U	20 U
1,1,1-Trichloroethane	20 U	20 U
Carbon Tetrachloride	20 U	20 U
Vinyl Acetate	20 U	20 U
Bromodichloromethane	20 U	20 U
1,2-Dichloropropane	20 U	20 U
trans-1,3-Dichloropropene	20 U	20 U
Trichloroethene	20 U	20 U
Dibromochloromethane	20 U	20 U
1,1,2-Trichloroethane	20 U	20 U
Benzene	20 U	20 U
cis-1,3-Dichloropropene	20 U	20 U
2-Chloroethylvinylether	20 U	20 U
Bromoform	20 U	20 U
2-Hexanone	20 U	20 U
4-Methyl-2-Pentanone	20 U	20 U
Tetrachloroethene	20 U	20 U
1,1,2,2-Tetrachloroethane	20 U	20 U
Toluene	20 U	20 U
Chlorobenzene	20 U	20 U
Ethylbenzene	20 U	20 U
Styrene	20 U	20 U
Total Xylenes	20 U	20 U

U - Not detected. Value is the quantitation limit.
UJ - Not detected. Quantitation limit is qualified as an estimate.
J - Detected result is qualified as an estimate.

4-19-92

Environmental Service Assistance Team -- Zone 2

ICF Technology, Inc.

ManTech Environmental

ESAT Region 10
ICF Technology, Inc.
1200 6th Avenue
Seattle, WA 98101
(206) 553-2632

MEMORANDUM

DATE: August 27, 1992

TO: Donald Matheny, Task Monitor
USEPA Region 10

Jerry Muth, Deputy Project Officer
USEPA Region 10

FROM: Paul Swift, Senior Chemist, ESAT 8/27/92

THROUGH: Barry Pepich, ESAT Team Manager

SUBJECT: Data Validation Report of Metals analysis of samples from Yakima Agricultural Research Laboratory
Project No.90042

TID NO. 10-9203-045

DOCUMENT NO: ESAT-10-B-6178

DISCUSSION:

Hong West and Associates submitted a closure certification report entitled "Yakima Agricultural Research Laboratory (YARL) Closure Certification Report Hazardous Waste Septic System Remediation" to USEPA Region 10 in partial fulfillment of the contract number 53-3K06-024. The site is currently on EPA's Superfund National Priority List and was ranked 1024 of a total of 1071 ranked sites (1,187 total sites).

The report included full metals analysis data to support the closure of the pesticide disposal system at YARL. The data were reviewed and QA'd by a technical team from Sweet Edwards/EMCON. However, due to the sensitivity of the project, the Region 10 ESAT was tasked to perform a final data validation.

SCOPE AND LIMITATIONS:

Two sets of metals raw data packages were received for review. The first set was analyzed in June, 1990 and the second set was analyzed on

October-November, 1990. Chain of custody (COC) records for some of the samples were available. However, the sample numbers reported on the COC were station or site numbers. The said COCs were not used in this review. The following documents were not available at the time of the review: (1) the corresponding laboratory number assigned for each sample received for analysis; (2) the documents pertaining to sample receipt, sample digestion and analysis and (3) the Inorganic Analysis Data Sheets (Forms I) or any of the QC summary forms. However, information provided on various bench sheets permitted the exclusion of sample groups which were identified as belonging to other projects. The number of analyses reviewed slightly exceeded the number of analyses listed in the Closure Report. Data interpretation, reduction and validation were performed. A spreadsheet of validated sample results were included by the reviewer at the end of this report.

In the case of some samples, analyses were not performed for all metals, or the raw data supplied by the laboratory was illegible. Therefore, for some samples no results are reported but are included in the data summary. Also, because no digestion logs were provided, it was impossible to accurately assess the results for soil samples. For this reason water criteria were applied for detection levels, and all results are reported in concentration units of micrograms/liter. Soil specifications were applied when their use would not introduce any ambiguity - as in the case of relative standard deviation among duplicate samples. Also, data was not qualified based on adherence to CLP protocols, such as the lack of proper Furnace QC/QC (analytical spikes).

The quality assurance (QA) review of 4 water and 31 soil samples, along with 8 samples of unknown matrix type, collected from the above referenced site has been completed. These samples were analyzed for trace metals according to SW-846 Methods rev. 1986 by Biospherics, Inc. located in Beltsville, MD. The samples, where data was provided, were numbered as follows (presented according to the approximate dates of analysis - GFAA, CVAA and ICP-AES analysis for each sample often took place over a time of 1-2 weeks):

Sample Nos.	Matrix	Approx. Date of Analysis
9010220	WATER	06/90
9010221	WATER	06/90
9010236	SOIL	06/90
9010237	SOIL	06/90
9010238	SOIL	06/90
9010239	SOIL	06/90
9010240	SOIL	06/90
9010241	SOIL	06/90
9010242	SOIL	06/90
9010243	SOIL	06/90
9010245	SOIL	06/90
9010246	SOIL	06/90
9010247	SOIL	06/90
9010248	SOIL	06/90
9010641	SOIL	06/90
9010642	SOIL	06/90

9010643	SOIL	06/90
9010644	SOIL	06/90
9010646	WATER	06/90
9010647	WATER	06/90
9010648	SOIL	06/90
9010649	SOIL	06/90
9010650	SOIL	06/90
9010651	SOIL	06/90
9010652	SOIL	06/90
9010653	SOIL	06/90
9010654	SOIL	06/90
9019421	SOIL	10/90
9019540	SOIL	10/90
9019541	SOIL	10/90
9019542	SOIL	10/90
9019543	SOIL	10/90
9019544	SOIL	10/90
9019545	SOIL	10/90
9019546	SOIL	10/90
9019547	SOIL	10/90
9019548	UNKNOWN	10/90
9019549	UNKNOWN	10/90
9019558	UNKNOWN	10/90
9019559	UNKNOWN	10/90
9019560	UNKNOWN	10/90
9019561	UNKNOWN	10/90
9019562	UNKNOWN	10/90
9019563	UNKNOWN	10/90

Note: The matrix of the samples were obtained by back calculation of the surrogate recoveries and analysis of the quantitation reports from the organic data.

DATA QUALIFICATIONS

The following comments refer to the laboratory performance in meeting the Quality Control Specifications outlined in the SW-846 Methods 6010, 7000 and 7470/7471- "Methods for Determinations of Metals - Inductively Coupled Plasma Emission Spectroscopy, Atomic Absorption Methods and Mercury in Liquid/Solid Waste", revision 1986 and the "Functional Guidelines for Evaluating Inorganic Analyses, revision 2/88".

The conclusions presented herein are based on the information provided for the review.

1. Timeliness

Due to the absence of the necessary documents (COCs, sample receipt logs, sample prep logs), the holding time criteria cannot be assessed.

2. Initial Calibration Verification

In most cases the concentrations of analytes in the ICV solutions could only be estimated due to the lack of sufficient documentation.

The raw data was verified with the reports submitted. The initial calibration verification for ICP standards all met the criteria for frequency and percent recovery with the exception of Aluminum (83%) for samples **9010648 - 9010654** and Zinc (87%) for samples **9019540 - 90109563.** The associated samples with concentrations > IDL were qualified **"J"** and those < IDL with **"UJ"**.

The initial calibration verification for GFAA, FAA and CVAA standards all met the criteria for frequency and percent recovery.

The analytical curves for FAA and CVAA analyses yielded acceptable linearity (correlation coefficients > 0.995).

The analytical curves for GFAA analyses yielded acceptable linearity (correlation coefficients > 0.995). However, the analytical curves for GFAA analyses for Thallium in samples **9019540 - 9019548** were constructed using a blank solution and two calibration standards, as opposed to three (as required by the Functional Guidelines). This data was reported without qualification, based on the initial calibration.

3. Continuing Calibration Verification

In most cases the concentrations of analytes in the CCV solutions could only be estimated due to the lack of sufficient documentation.

The frequency of analysis and the recovery criteria were met by all of the analytes in the CCVs, with the exception of ICP analyses for Aluminum (115%) in samples **9019540 - 9019543.** The associated sample results were qualified as estimates, **"J"**. Otherwise, the analytical recoveries ranged from 90.1-109.6%.

4. Instrument Detection Limits

Documentation of instrument detection limits was not provided. The instrument detection limits were assumed to be equal to the contract required detection limits (CRDLs), described in the "Contract Laboratory Statement of Work for Inorganic Analyses - version 2/88", since the methods are very similar. The CRDLs were verified at the correct concentrations in each of the analytical sequences performed in each of the instruments used in the analyses.

5. Blanks

Background levels for all target analytes in the initial and continuing calibration blanks were below the CRDLs with the exception of Zinc and Antimony in ICP analyses for samples **9010641 - 9010644** and **9010245 - 9010248**, respectively. The continuing calibration and preparation blanks met the criteria for frequency

Samples with concentrations that were less than five times the value detected in their associated blank(s) were qualified **"U"** (undetected). The following samples were qualified due to blank contamination:

Zinc - **9010641, 9010642, 9010643 and 9010644**

Antimony - **9010245, 9010246, 9010247 and 9010248**

6. ICP Interference Check

The ICP interference check sample (ICS) yielded recoveries that were within control limits (80-120%). The recoveries ranged from 81-117%.

For some analyses ICS solutions were not analyzed. The associated data was not qualified.

Antimony, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Nickel, Potassium, Silver, Vanadium and Zinc all gave positive or negative results in the ICS solution A with values that were greater than or equal to the assumed IDL (CRDL). The analytes mentioned above were not originally present in the ICS solution A. The detection was due to the interference effects of Calcium, Iron, Magnesium and Iron at high concentrations (approximately 200-500 ppm) in the ICS solution A.

The ICP raw data was examined. Since the concentrations of Aluminum, Calcium, Iron and Magnesium in the samples were found to be less than their respective concentrations in the ICS solution A, the possibility of bias due to interference effects was very small. Therefore, none of those analytes mentioned above were qualified based on this criteria.

7. Laboratory Control Samples

The analyte concentrations in the laboratory control samples (LCS) was not provided, and could only be estimated. It could not be determined whether the LCS criteria had been met.

8. Duplicate Sample Analysis

The relative percent difference (RPD) between duplicate values were within control limits for all target analytes except Lead in samples 9010236 and 9010245, and Zinc in sample 9010236. In the case of Lead the analyte concentration of either the original or duplicate sample was determined to be outside of the calibration range. The samples were not diluted and reanalyzed. For this reason the following samples were qualified as estimates, "J":

9010236, 9010237, 9010238, 9010239, 9010240, 9010241, 9010242 9010243, 9010245, 9010246, 9010247 and 9010248

The RPD for Zinc in the following samples was greater than two times the CRDL; as a result these samples were qualified "J":

9010236, 9010237, 9010238, 9010239, 9010240, 9010241, 9010242 and 9010243

9. Field Duplicates

Based on the information provided, it was not apparent that any samples designated as field duplicates were provided.

10. Matrix Spike

The frequency of analysis of the matrix spike was met. All analytes met the recovery control limits (75-125%) with the exception of Antimony (ICP, 16%), Arsenic (GFAA, 38-62%), Selenium (GFAA, 0-38%) and Thallium (23.8%). Consequently, the detected results and quantitation limits of Arsenic and selected Selenium were qualified as estimated "**J** or **UJ**" (estimated). Detected results and quantitation limits for Antimony, Thallium and selected Selenium were qualified as "**R**". The following results were qualified based on out of control spike recovery results:

	Antimony	Arsenic	Selenium	Thallium
9010641		J	R	R
9010642		J	R	R
9010643		J	R	R
9010644		J	R	R
9010646		J	UJ	UJ
9010647		UJ	UJ	UJ
9010648	R	J	UJ	UJ
9010649	R	UJ	UJ	UJ
9010650	R	J	UJ	UJ
9010651	R	J	UJ	UJ
9010652	R	UJ	UJ	UJ
9010653	R	J	UJ	UJ
9010654	R	J	UJ	UJ

11. ICP Serial Dilution

Aluminum, Barium, Calcium, Iron, Magnesium and Manganese had concentrations which were greater than 50 times IDL (CRDL used). At a five-fold dilution of the sample the percent differences (%D) between the original and the diluted samples were less than the control limit of 10%. However, a number of samples contained one or more of these analytes at concentrations greater than the calibration range of the ICP. Although the data was not qualified on the basis of serial dilution performance, this criteria is not considered to have been met.

12. Furnace AA Analysis

The Functional Guidelines states "If the sample absorbance is <50% of the post digestion spike absorbance and the post digestion spike recovery is not within 85-115%, qualify the sample results > the IDL as "J" (estimated) or if the sample results are < the IDL, qualify the results as "UJ" (not detected at the estimated detection limits)." The following selenium sample results were qualified 'UJ" based on the out of control post digestion analytical spike recoveries:

9010237, 9010238, 9010239, 9010240, 9010241, 9010242 and 9010243

Method of Standard Addition Analysis (MSA) for Selenium of sample **9010221** resulted in an analytical curve with a correlation coefficient of <0.995; the result for this sample was qualified as "J".

Arsenic analysis of sample **9019546** resulted in data which was qualified as "J" because of out of control analytical post spike recovery. MSA analysis was indicated based on the criteria described above, but was not performed. MSA analysis for Arsenic on sample **9010221** yielded results which were qualified as "J" because the correlation coefficient of the analytical curve was <0.995.

Lead analysis of the following samples utilized only single injections and no MSA analysis; as a result, the following samples were qualified as "J":

9010646, 9010647, 9010648, 9010649, 9010650, 9010651, 9010652 and 9010653

The following samples were qualified as "J" based on correlation coefficients of less than 0.995 from Lead MSA analysis:

9010236, 9010237, 9010239, 9010240, 9010241, 9010242 and 9010243

Samples **9010238** and **9019546** were qualified "J" based on low analytical spike recovery and lack of corrective action.

13. Verification of Sample Results

All samples and blanks were analyzed in accordance with the SW-846 specified methods. The raw data has been verified with the report. Qualification of additional samples based on analytical results which were outside of the instrumental calibration range is indicated as follows:

Sample	Element	Qualifier	Reason
9019560	Al	J	Outside ICP cal. range
9019558	Ca	J	Outside ICP cal. range
	Mg	J	Outside ICP cal. range
	Mn	J	Outside ICP cal. range
9019559	Mn	J	Outside ICP cal. range
9019560	Fe	J	Outside ICP cal. range
9019561	Mn	J	Outside ICP cal. range

14. Laboratory Contact

The laboratory was not contacted for this review.

15. Data Use - Acceptable

The data as qualified is acceptable for use.

DATA QUALIFIER DEFINITIONS

U- The analyte was analyzed for and is not present above the level of the associated value. The associated numerical value indicates the approximate concentration necessary to detect the analyte in this sample.

If a decision requires quantitation of the analyte below the associated numerical level, reanalysis or alternative analytical methods should be considered. The technical staff is available to discuss available options.

J- The analyte was analyzed for and was positively identified, but the associated numerical value may not be consistent with the amount actually present in the environmental sample. The data should be seriously considered for decision making and are usable for many purposes.

A subscript may be appended to the "J" that indicates which of the following quality control criteria were not met:

1 Blank contamination: indicates possible high bias and/or false positives.

2 Calibration range exceeded: indicates possible low bias.

3 Holding times not met: indicates low bias for most analytes with the exception of common laboratory contaminants and chlorinated ethenes (i.e.: trichloroethene, 1,1-dichloroethene, vinyl chloride).

4 Other QC outside control limits: bias not readily determined.

R- The data are unusable for all purposes. The analyte was analyzed for, but the presence or absence of the analyte has not been verified.

Resampling and reanalysis are necessary to confirm or deny the presence of the analyte.

UJ - A combination of the "U" and "J" qualifier. The analyte was analyzed for and was not present above the level of the associated value. The associated numerical value may not accurately or precisely represent the concentration necessary to detect the analyte in this sample.

If a decision requires quantitation of the analyte close to the associated numerical level, reanalysis or alternative analytical methods should be considered.

N- The analysis indicates that an analyte is present, and there are strong indications that the identity is correct.

Confirmation of the analyte requires further analysis.

NJ- A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

A subscript may be appended to the "NJ" that indicates which of the following situations applies:

1 DDT/Endrin breakdown evident.

2 Interference from other sample components.

3 Non-Target Compound List (TCL) compounds (Confirmation is necessary using specific target compound methodology to accurately determine the concentration and identity of the detected compound).

4 A confirmation analysis was missing or quality control criteria were not met for the confirmation analysis.

NOTE: Data users are encouraged to contact their Regional representative within ESD to clarify or obtain further information on the appropriate use of analytical data.

Yakima Agricultural Research Laboratory Data Review – Metals

Sample ID	9010216	9010217	9010218	9010220	9010221	9010236	9010237
Matrix	WATER	WATER	WATER	WATER	WATER	SOIL	SOIL
Element							
Aluminum				2536	37865	131470	159500
Antimony				60 U	60 U	628.6	752.9
Arsenic				10.2	40.2 J	146	37.8
Barium				200 U	285	906	1164
Beryllium				5 U	5 U	5 U	6.1
Cadmium				5 U	6.4	16.5	25.3
Calcium				16500	32340	56200	76340
Chromium				10 U	10 U	182	212
Cobalt				50 U	50 U	98.5	109.5
Copper				37.9	122.8	208.1	209.5
Iron				3560	53525	209750	230604
Lead				18.1	250	800 J	84.5 J
Magnesium				6388	17320	43450	53470
Manganese				64.8	957	4996	4598
Mercury			0.2 U				
Nickel				40 U	98	252.9	235.5
Potassium				5120	10250	15100	19800
Selenium				5 U	5 UJ	5 U	5 UJ
Silver				10 U	10 U	10 U	10 U
Sodium				14527	15213	6622	6068
Thallium				10 U	10 U	10 U	10 U
Vanadium				50 U	86.7	406.8	442.2
Zinc				1274	339	391.6 J	646.5 J

8/27/92

Yakima Agricultural Research Laboratory Data Review – Metals

Sample ID	9010238	9010239	9010240	9010241	9010242
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL
Element					
Aluminum	173340	159500	132830	147466	163174
Antimony	832.2	787.9	740	794.8	810
Arsenic	40.3	41.7	45.2	54	65.6
Barium	1075	1101	1147	958	1046
Beryllium	6.6	6	6.1	6.1	6.7
Cadmium	20.6	12	17	18.1	10.7
Calcium	49430	52420	108960	50060	56310
Chromium	220	217	195	208	218
Cobalt	127.9	106.3	106.4	100.7	111.2
Copper	233.6	230.7	205.9	220.5	228.4
Iron	245780	242750	222680	232250	239650
Lead	100 J	69.9 J	72.1 J	70 J	53.3 J
Magnesium	61127	60269	65868	63371	74998
Manganese	3880	2200	4400	3033.8	3502.4
Mercury			0.2 U	0.48	0.2 U
Nickel	249.9	289.7	239.2	219.5	251.2
Potassium	19300	20100	13500	18400	18200
Selenium	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ
Silver	10 U	10 U	10 U	10 U	10 U
Sodium	7645	8647	6836	8838	8978
Thallium	10 U	10 U	10 U	10 U	10 U
Vanadium	458.2	448	420.3	447.7	501.4
Zinc	494.7 J	486.5 J	497 J	666.7 J	540.8 J

8/22/02

Yakima Agricultural Research Laboratory Data Review – Metals

Sample ID	9010243	9010245	9010246	9010247	9010248	9010333
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	WATER
Element						
Aluminum	149670	134830	165140	149800	150590	
Antimony	806.6	790.9 U	937.5 U	910.3 U	889.5 U	
Arsenic	103.2	143.6	367.6	230	257.2	
Barium	980	1174	1298	1277	1229	
Beryllium	5.9	6.6	7.5	7.9	7.1	
Cadmium	16.1	15.8	10.6	17.6	21.9	
Calcium	65710	80330	57090	61640	63430	
Chromium	226	214	231	202	235	
Cobalt	105.2	101.2	135.1	122.4	108.5	
Copper	213.9	222.6	218.3	223.2	219.9	
Iron	229810	224530	243140	239650	228290	
Lead	52.9 J	1005 J	1428 J	1050 J	2960 J	
Magnesium	64680	51350	78770	55580	48780	
Manganese	4290	4400	4970	4940	4380	
Mercury	0.2 U	0.2 U	0.41	0.2 U	0.2 U	
Nickel	277.4	220.3	497.1	228.1	213.2	
Potassium	16500	24500	22200	21350	25400	
Selenium	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	
Silver	10 U	10 U	10 U	10 U	10 U	
Sodium	7783	5361	5990	5968	6356	
Thallium	10 U	10 U	10 U	10 U	10 U	
Vanadium	465.5	418.9	437.6	434.9	430.4	
Zinc	469.7 J	980.1	704.6	830.5	963.7	

8/27/92

Yakima Agricultural Research Laboratory Data Review – Metals

Sample ID	9010334	9010366	9010469	9010532	9010641	9010642
Matrix	WATER	WATER	WATER	WATER	SOIL	SOIL
Element						
Aluminum					81190	81710
Antimony					60 U	60 U
Arsenic					35.4 J	63.8 J
Barium					1118.5	1321.5
Beryllium					5 U	5 U
Cadmium					6.4	30.7
Calcium					55000	55000
Chromium					171.3	487.5
Cobalt					23	131.9
Copper					327.8	327.8
Iron					198575	274150
Lead					68	308.7
Magnesium					63975	63350
Manganese					4887.5	5497.5
Mercury					0.2 U	0.2 U
Nickel					292.1	570
Potassium					17500	23700
Selenium					5 R	5 R
Silver					16.9	27.2
Sodium					5239	6847
Thallium					110 R	10 R
Vanadium					350.3 J U	350.3 J U
Zinc					413.6 J U	784.9 J U

8/27/92

Yakima Agricultural Research Laboratory Data Review – Metals

Sample ID	9010643	9010644	9010646	9010647	9010648	9010649
Matrix	SOIL	SOIL	WATER	WATER	SOIL	SOIL
Element						
Aluminum	100890	107060	91200	8982	77880 J	68100 J
Antimony	60 U	60 U	60 U	60 U	60 R	74.9 R
Arsenic	39.1 J	20.9 J	29.2 J	10 UJ	17.9 J	10 UJ
Barium	1256.7	1203.2	1160	200 U	501.9	454.2
Beryllium	5 U	5 U	5 U		5 U	5 U
Cadmium	21.8	17.7	35.5	8.5	14.2	11.3
Calcium	52640	104580	129100	24200	24800	15300
Chromium	189.3	166.4	169.2	33.4	90.1	339.2
Cobalt	112.6	92.2	87.2	8.4	47.2	60.3
Copper	327.8	285.5	301.8	79.3	120.3	108.4
Iron	223065	188100	36237	19970		
Lead	104.4	60.8	191.3 J	75.2	44.4 J	29.2 J
Magnesium	50625	60700	55435	9784	27862	18560
Manganese	4995	4390	26558	437.6	1891.5	1894.5
Mercury	0.2 U	0.2 U			0.2 U	0.2 U
Nickel	614.8	208.8	242.3	31.7	161.2	1102.5
Potassium	22650	19750	22750	11900	8465	8800
Selenium	5 R	5 R	5 UJ	5 UJ	5 UJ	5 UJ
Silver	25.1	15.3	10 U	10 U	10 U	10 U
Sodium	5468	4402	34619	26126	5000 U	5000 U
Thallium	10 R	10 R	10 UJ	10 UJ	10 UJ	10 UJ
Vanadium	464	359.4	258.4	54.9	143.6	138.9
Zinc	490 SU	344 SU	1324.6	549.3	183.6	172.3

8/27/92

Yakima Agricultural Research Laboratory Data Review – Metals

Sample ID	9010650	9010651	9010652	9010653	9010654	901548E
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Element						
Aluminum	93537 J	76545 J	53140 J	84213 J	84213 J	
Antimony	60 R	60 R	60 R	60 R	60 R	
Arsenic	28.6 J	11.7 J	33.9 UJ	22.7 J	31.8 J	
Barium	819.7	409.1	713.3	731.6	538.1	
Beryllium	5 U	5 U	5 U	5 U	5 U	
Cadmium	16.1	15.3	20.4	20.7	17.4	
Calcium	89700	23100	70400	28500	30600	
Chromium	94	71.2	97.5	167.8	83.4	
Cobalt	52.2	48.3	55.8	72.7	53.5	
Copper	130	88.6	146.4	133.4	118.6	
Iron						
Lead	76.4 J	25.8 J	66.5 J	31.9 J	57.1	
Magnesium	32115	20320	33920	33190	30100	
Manganese	3472.5	1735.5	2726	3097.5	2338.5	
Mercury	0.2 U	0.2 U	0.2 U	0.38	0.2 U	
Nickel	150	95.9	172.1	207.1	135	
Potassium	11400		12900	12300	12700	
Selenium	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	
Silver	10 U	10 U	10 U	10 U	10 U	
Sodium	5000 U	5000 U	5000 U	5000 U	5000 U	
Thallium	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	
Vanadium	186.9	177.7	206.7	265.2	195.7	
Zinc	251.1	159.4	262.2	280.6	207.4	

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Yakima Agricultural Research Laboratory Data Review – Metals

Sample ID	9019420	9019421	9019540	9019541	9019542	9019543
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Element						
Aluminum			91710 J	112440 J	94060 J	104120 J
Antimony		60 UJ	60 R	60 R	60 R	60 R
Arsenic			29.1	32.8	18.3	47.4
Barium			810.2	881.3	820.9	971.4
Beryllium			5 U	5 U	5 U	5 U
Cadmium			5 U	5 U	5 U	5 U
Calcium			27450	28070	34830	31090
Chromium			24.4	135.9	143.4	148.4
Cobalt			50 U	69.6	63	67.1
Copper			116.7	131.6	122.7	121.9
Iron			130550	151200	140180	149920
Lead			33.3	27	25.3	29.2
Magnesium			30627	32103	44655	38367
Manganese			2131	1898	2619	2822
Mercury			0.2 U	0.2 U	0.2 U	0.2 U
Nickel			40 U	126.7	211.3	187.8
Potassium						
Selenium			5 U	5 U	5 U	5 U
Silver			10 U	10 U	10 U	10 U
Sodium			5000 U	5000 U	5000 U	5209
Thallium			10 U	10 U	10 U	10 U
Vanadium			282.1	331.6	295.2	325.4
Zinc			279.8	335	285.2	299.2

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Yakima Agricultural Research Laboratory Data Review – Metals

Sample ID	9019544	9019545	9019546	9019547	9019548	9019549
Matrix	SOIL	SOIL	SOIL	SOIL	UNKNOWN	UNKNOWN
Element						
Aluminum	96270	102890	100630	11245	9813	4278
Antimony	60 R	60 R	60 R	60 R	60 U	60 U
Arsenic	40	32.4	96.8 J	73.6	10 U	10 U
Barium	832.3	852.6	1008.2	1030.9	200 U	200 U
Beryllium	5 U	5 U	5 U	5 U	5 U	5 U
Cadmium	5 U	5 U	5 U	8.5	5 U	5 U
Calcium	41770	30420	31710	29160	16810	3920
Chromium	120.7	121.8	99.7	122.2	15.1	10 U
Cobalt	66.1	65.4	58.6	67.8	50 U	50 U
Copper	121.9	128.7	123.7	127.9	63	30.7
Iron	141050	144920	141520	153730	13288	6022
Lead	31.7	30	136 J	129	22	
Magnesium	39127	39436	26881	28622	8894	1921
Manganese	2960	3778	2714	2866	272.8	118.2
Mercury	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	153.9	181.2	107.3	118.2	40 U	40 U
Potassium	10800	12400	13000	13000		5000 U
Selenium	5 U	5 U	5 U	5 U	5 UJ	5 UJ
Silver	10 U	10 U	10 U	10 U	10 U	10 U
Sodium	5000 U	5000 U	5000 U	5000 U	12412	5000 U
Thallium	10 U	10 U	10 U	10 U	10 U	10 U
Vanadium	298.3	305.2	292.5	315.2	56.3	50 U
Zinc	287.6	283.5	335	357.5	144.4	174.7

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Yakima Agricultural Research Laboratory Data Review – Metals

Sample ID	9019558	9019559	9019560	9019561	9019562	9019563
Matrix	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN
Element						
Aluminum	5615	35524	29958 J	36318	36100	35791
Antimony						
Arsenic						
Barium	1768.1	920.9	200 U	404.1	497.7	500.3
Beryllium	5 U	5.7	5 U	5 U	5 U	5 U
Cadmium	7.9	7	5 U	5 U	8.9	9.4
Calcium	272650 J	12250	5160	7440	6080	10770
Chromium	24	167.4	58.7	84.8		
Cobalt	50 U	152.4	50 U	128.1		
Copper	173.5	403.6	95.6	214.4	216.2	506.9
Iron	32637	29704	32669 J	32205		
Lead						
Magnesium	82468 J	30892	7196	15452	20133	19711
Manganese	2087 J	2201.7 J	813.4	2266 J		
Mercury						
Nickel	53.1	253.8	68.7	122.1		
Potassium	47800	20800	5600			
Selenium						
Silver	10 U	10 U	10 U	10 U	10 U	10 U
Sodium	2397400	5000 U	5000 U	5000 U	5000 U	11590
Thallium						
Vanadium	50 U	299.4	123.6	181.8	212.2	222.8
Zinc	3925.8	1949.5	651.9	786.1	763.5	2672.3

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